PHF–BAL Intergreated Evidential Update

Temporal Surface, Hydrological and Ground-Condition Manifestations Across the Peel Hill Farm–Ballam Road Corridor, 2017–2026

Title-page image. 2018–2022 LiDAR-difference context for the Peel Hill Farm study area. The red box is a locational aid for the initial location presented.

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30 July 2026

V0.1.6: integrated working evidential draft for regulatory and expert review; not a causal determination

Report series context:

This report forms part of a wider series of technical field and evidential studies concerning surface, hydrological and ground-adjustment observations around Preston New Road and the surrounding Fylde landscape. It should be read alongside Evidence of Progressive Ground Adjustment and Subsurface Flow Reorganisation around Preston New Road, which provides the principal location framework and broader spatial context used throughout this paper.

Other reports in the series examine related observations at Preston New Road, Peel Hill, Gardeners Lower Fields and adjoining locations using aerial imagery, field photography, LiDAR comparison, temporal analysis and targeted environmental measurements. Each report remains evidentially self-contained while contributing to the wider spatial-temporal record.

First-release note: This report has been prepared and reviewed within a limited pre-deconstruction timeframe. Priority has been given to evidential accuracy, figure sequence and internal consistency. Some appendix filenames and working image identifiers remain to be standardised, and minor presentational defects may persist. These matters are administrative and do not affect the evidential content or conclusions of the report.

Executive summary

This report presents an integrated assessment of changing water, vegetation, sediment-like, surface and relative-elevation expressions across a connected agricultural and drainage-dependent landscape extending from Peel Hill Farm towards Ballam Road. It draws solely on the repeat aerial imagery, Google Earth comparisons, DEFRA LiDAR-difference views and prior project reports already assembled within the evidential record.

The archive does not show one fixed morphology. It records repeated hydrological loading, open water and saturation; red-brown, pale, cream, white and dark tonal responses; residual field differentiation after flood recession; stressed or absent vegetation; bank and tree disturbance; circular, point-like, exposed and locally mound-like forms; low-relief pale emergences; and spatially organised relative elevation change. These categories recur at adjacent and near-adjacent locations under contrasting wet, recovered, harvested and dry-season conditions.

The strongest evidential contribution is the combined pattern rather than any single dramatic feature. Several sectors first appear as water-sensitive ground, later retain staining, mottling or reduced growth after open water recedes, and subsequently re-express as discrete disturbances, pale material, stressed lines or altered field geometry. Independent LiDAR or satellite differentiation occurs at several of the same locations. The sequence extends from the adjacent lowering bowl and Gardeners Lower Fields/Location 4 corridor into the first southward field, the intermediate drainage-boundary field, Ground Adjustment Location 11 and the Hex pond complex, the fields south of the Preston New Road/Moss House Lane junction, the field between Ground Adjustment Locations 2 and 3, and fields east of Peel Road.

The supported conclusion is therefore bounded but material: the record establishes a sufficiently coherent, recurrent and spatially expanding set of water, vegetation and ground-condition manifestations that incident-by-incident assessment is inadequate. A proportionate response is integrated field inspection, repeat topographic survey, drainage mapping, simultaneous water-level observations, and targeted paired sampling of recurring water, wet sediment, pale material, staining and unaffected controls.

The report is observational and does not assign source or mechanism. Its purpose is to determine whether the combined spatial-temporal record is sufficiently coherent to require integrated inspection, measurement and sampling.

All images are available from the author on request. A high-resolution companion video containing the images used in this report, together with additional views and close-ups, is available at: https://archive.org/details/july-report-video

The video follows approximately the same spatial sequence as the report, while presenting the images chronologically within each location. It is intended to be paused where closer inspection of individual frames is required.

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1. Purpose and scope

This report assesses changing ground, vegetation and water expressions along the Peel Hill Farm–Ballam Road corridor as one integrated evidential system.

The evidence comprises repeat image pairs and temporal sequences showing early condition, wet condition, sediment-like or tonal response, vegetation stress, exposed or disturbed ground and independent LiDAR or satellite context. The principal question is whether repeated spatially coherent manifestations warrant integrated investigation rather than treatment as unrelated visual incidents.

The report optimises for explanatory power. Locations are presented in a spatially connected sequence, while the final synthesis draws together the recurring manifestation classes and their wet-to-dry temporal relationships. Earlier report cross-references are retained where they improve traceability.

2. Evidence base, method and evidential controls

2.1 Evidence base

- repeat UAV stills and date-labelled video or DNG-derived stills from the retained aerial archive;
- Google Earth imagery where it provides an independent lower-resolution chronology;
- Environment Agency LiDAR epochs for 2018 and 2022, displayed as relative elevation difference; and
- earlier project reports describing the wider lowering corridor, scarps, ponding, field depressions and sediment manifestations.

Camera position, altitude, illumination, season, grazing, vegetation condition, agricultural management and image processing vary between dates. Interpretation therefore depends on recurring location, geometry, persistence and relationship to water-sensitive ground rather than colour or appearance alone.

The imagery identifies recurring locations and relationships where targeted formal investigation would be beneficial.

2.2 Comparative method

The analysis uses a three-part comparative method: recognition of a manifestation within an individual image; comparison against earlier or later UAV, Google Earth, LiDAR and wider landscape views; and bounded interpretation that separates direct observation from inference.

Temporal sequences are used to distinguish intermittent surface expression from permanent form. Wet-state imagery establishes hydrological loading; recession imagery records residual condition; later dry or recovered imagery tests whether differentiation persists or reappears after open water is absent.

LiDAR-difference views are treated as an independent spatial comparison layer. They can show relative change between epochs but do not diagnose settlement, consolidation, shrink–swell, drainage change, fines migration or any other mechanism.

2.3 Terminology controls

Bowl: a broad low or water-sensitive area visible in imagery and LiDAR context; descriptive, not a surveyed geomorphological classification.

Hydrological manifestation: visible ponding, saturation, water-aligned vegetation response, sediment-like expression or related surface condition that warrants hydrological investigation.

Lowering: negative relative elevation change in the 2018–2022 LiDAR comparison; not a current engineering survey and not a mechanism determination.

Staining: colour alteration recorded without assigning chemistry or source.

Splodge-type manifestation: a comparatively fluid-looking, pale to white or cream, low-relief expression with a discrete apparent origin and spreading or fan-like geometry.

Mudboil: a visibly domed soil or mud uplift; reserved for images showing apparent positive relief.

Discrete emergence: a smaller point-source pale, cream, dark or exposed expression whose relief and composition are unresolved.

Potential connection: spatial and temporal coherence sufficient to test a shared shallow-water or ground-adjustment system; not proof of a subsurface conduit.

3. Location nomenclature and analytical framework

PHF-BAL identifiers are assigned to defined evidential locations or landscape units. Existing Ground Adjustment report labels are retained as cross-references. The numbering follows the integrated spatial progression rather than the order in which the working sections were drafted.

Identifier	Integrated location	Cross-reference / role
PHF-BAL-001	Adjacent lowering bowl	Contextual Peel Hill Farm bowl sequence
PHF-BAL-002	Gardeners Lower Fields and Location 4 drainage corridor	Includes the immediately adjoining field; GLF corresponds to Ground Adjustment Location 5
PHF-BAL-003	First southward field	Immediately south of the previously examined location; observer-identified reduction of a formerly raised form
PHF-BAL-004	Intermediate field and drainage boundary	Bridges the first southward field and Location 11 sequence
PHF-BAL-005	Location 11 and Hex pond complex	Ground Adjustment Location 11; includes adjoining July 2026 PNR-1z corridor imagery
PHF-BAL-006	Fields south of PNR/Moss House Lane junction	Southeast continuation from Location 11
PHF-BAL-007	Intervening field between Locations 2 and 3	Local spatial link between those Ground Adjustment report locations
PHF-BAL-008	Fields east of Peel Road	Final southeastward field group

15 November 2017
Subtle surface differentiation in the wider field

16 July 2026
Later surface break and bare junction within the same broader corridor

Figure 1. *Illustrative temporal context within the wider PHF–BAL area. The 15 November 2017 frame records subtle field-scale differentiation; the 16 July 2026 frame records a later bare junction and converging surface lines elsewhere within the same wider corridor. The panels are contextual, the position of the bare patch can be triangulated by the farm gate visible in both images*

The opening comparison establishes that the corridor expresses through more than one manifestation class. It does not equate the two forms. It provides the analytical reason to retain field-scale wetness, discrete ground features, vegetation response and independent lowering within one report architecture.

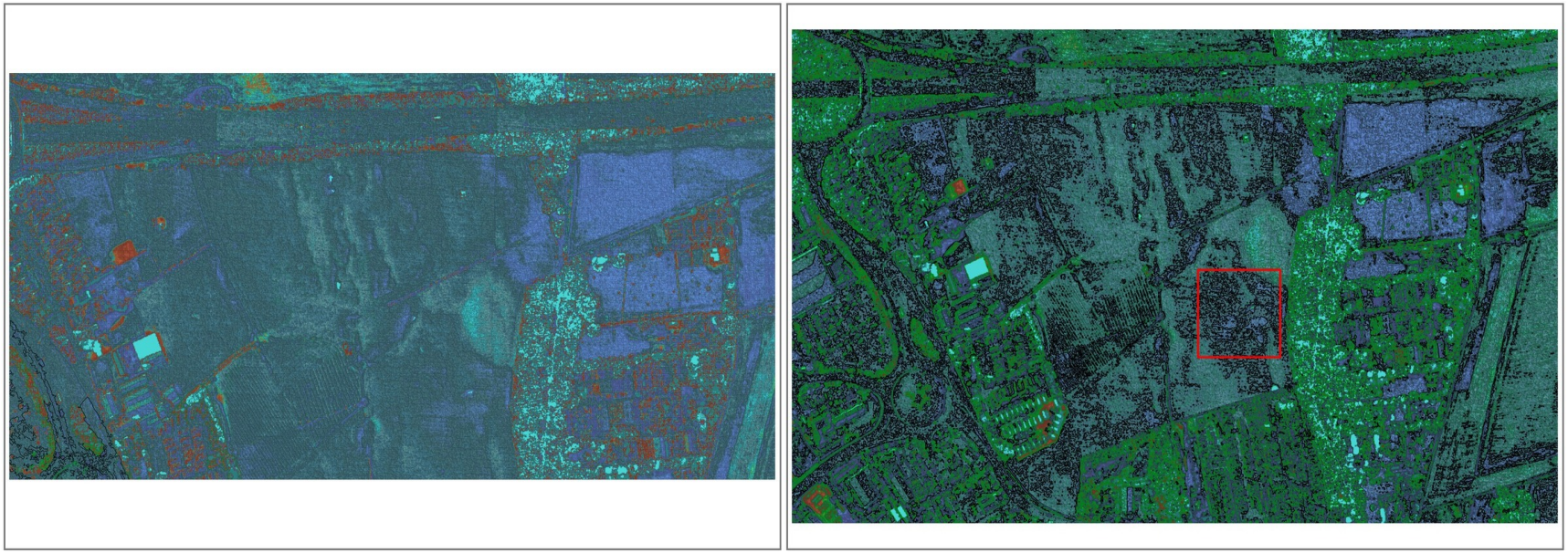


Figure 2. *LiDAR-difference context. The wider panel places the corridor within the 2018–2022 relative elevation-change display; the second panel locates the adjacent bowl considered in PHF-BAL-001.*

4. PHF-BAL-001 — Adjacent lowering bowl

Why the bowl is included

The bowl is important to the wider evidential picture. It is included because the same broad study area produced concentrated ponding and an elongated saturated footprint in 2017, whereas other PHF–BAL locations present as scarps, depressions, sediment patches or reduced growth.

That difference in form matters. A connected shallow hydrological setting need not produce one repeated surface shape at every point. Local relief, soil condition, drainage, vegetation and antecedent moisture can determine whether water appears as open ponding, diffuse saturation, seepage-aligned vegetation response or later exposed ground.

October 2017 sequence

Figure 3. *Contextual hydrological manifestation within the adjacent lowering bowl. Images from 3, 14 and 22 October 2017 show concentrated standing water, submerged or saturated vegetation and an elongated wet footprint. The sequence demonstrates a differing category of surface manifestation within the wider study area; detailed analysis is reserved for the Peel Hill Farm Sentinel Field Study.*

The sequence records more than a single isolated puddle. The close and oblique views show an open-water core, a broader pale or saturated margin, and an elongated continuation through the field. The manifestation is coherent at field scale and occupies the locality identified in the LiDAR context.

The imagery does not by itself establish where the water originated or whether the bowl is directly connected to any particular scarp, depression, drain or site feature. It does, however, reinforce the case for investigating these locations as potentially connected components of the same shallow hydrological system rather than processing each visual report as an unrelated call.

Scope control

Only the minimum chronology needed for that contextual point is retained in the main body. Additional dates are placed in Appendix B. Further questions concerning the bowl's full extent, topographic development, water balance, relationship to the wider lowering pattern and recurrence after 2017 are reserved for the PHF study.

PHF-BAL-001 therefore functions as the early hydrological context for the remaining locations. Its evidential role is to demonstrate a broad, organised water expression within the same wider landscape in which later scarps, depressions, pale material, stressed vegetation and exposed ground are recorded. It does not alone establish a direct pathway to any other location.

5. PHF-BAL-002 — Gardeners Lower Fields and Location 4 drainage corridor

PHF-BAL-002 integrates the earlier field-adjoining-Location-4 section of the Evidence of Progressive Ground Adjustment and Subsurface Flow Reorganisation around Preston New Road, with the substantially expanded Gardeners Lower Fields chronology. Gardeners Lower Fields correspond to Location 5 in the Ground Adjustment report. The immediately adjoining field, Main Drain, tributary margins, Location 4 bank and broader cultivated fields are treated as one analytical landscape unit while preserving uncertainty about hydraulic connection and mechanism.

5.1 Immediately adjoining field and Location 4 bridge

The field lies on the opposite side of the Main Drain from the principal Location 4 bank manifestations. The intervening watercourse, field margins, tree line and overhead power lines provide stable spatial references across the image sequence.

The selected imagery records changing water, vegetation and surface conditions between October 2017 and July 2026. Its purpose is not to attribute these changes to a single mechanism, but to establish whether several manifestation classes recur within the same narrow landscape setting:

- red or brown-toned water and vegetation;
- localised surface disturbance;
- extensive ponding;
- an irregular uncropped or poorly established field margin;
- later scarp-like bank forms; and
- renewed or persistent tonal and surface differentiation under dry, harvested conditions.

The neighbouring Location 4 record is relevant because it documents recurrent deformation, seepage and sediment redistribution across both sides of the same drainage-dependent setting. That proximity does not establish hydraulic connection, but it warrants examination of the field and bank observations together rather than as unrelated features.

Observational chronology

Condition on 12 October 2017

The 12 October 2017 image shows red to red-brown colouration within vegetation in both adjoining fields and within or immediately beside the watercourse. The colour is spatially variable rather than uniform across the wider vegetation cover.

Cattle are gathered around a localised area of fluid or saturated ground near the lower field margin. The fluid contains a dark central or patchy component surrounded by a paler brown-red tint.

Condition on 16 October 2017

By 16 October, localised standing water or strongly saturated ground is visible along the channel-side field margin. The wider view also records multiple small, irregular dark or exposed surface features within the adjoining fields. These features interrupt otherwise more continuous vegetation but cannot be classified reliably from the aerial image alone.

A broad, curved strip beside the channel is without an established crop or has markedly reduced vegetation compared with the field interior. Its width and irregular geometry are visually distinct from the narrow vegetated channel margin. The image does not establish whether this strip was deliberately left uncultivated, had been disturbed during field or drainage work, could not be worked because of wet ground, or represents crop-establishment failure.

Trees and established boundary vegetation remain visible along the channel at this date. Later archive imagery records deterioration or loss of trees within this corridor.

Condition on 25 October 2017

The 25 October image records extensive open water across a substantial part of the cropped field. The inundated area is broadly triangular or fan-shaped and extends well beyond the immediate channel margin.

The standing water has a pronounced brown to red-brown appearance. Water is also visible along the field boundaries and within adjoining marginal areas. Surviving crop or vegetation remains visible through the shallower outer parts of the inundated area.

This frame represents a substantial increase in visible water extent relative to 12 and 16 October. It does not, by itself, distinguish between rainfall accumulation, overbank or drainage-system flooding, shallow groundwater emergence, restricted drainage, or a combination of these processes.

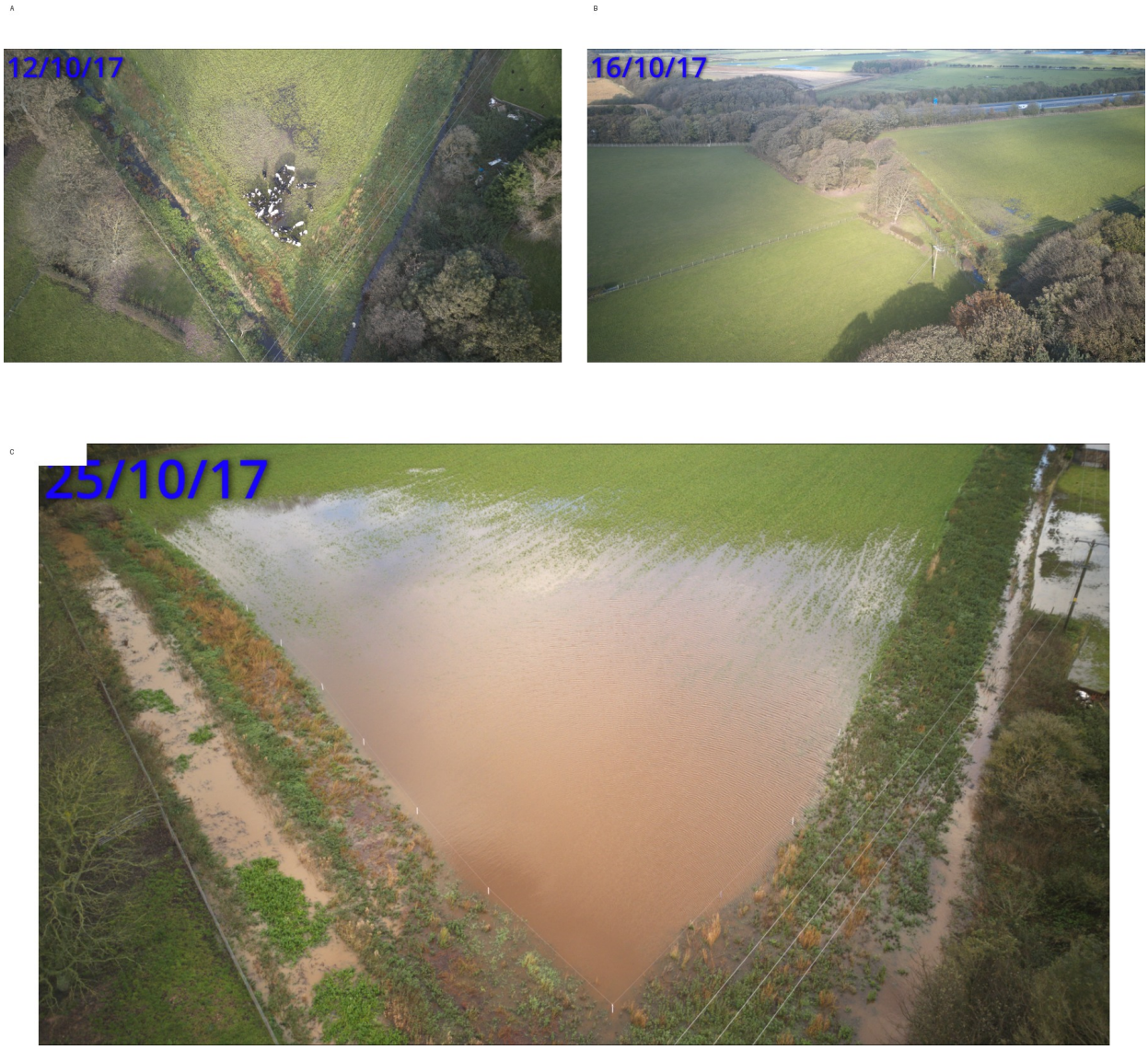


Figure 4. *October 2017 development at PHF-BAL-002. (A) On 12 October, red to red-brown vegetation is visible in both adjoining fields and within the channel corridor, with a localised area of dark and paler brown-red fluid or saturated ground around the cattle. (B) By 16 October, local wetness, scattered irregular surface features and a broad uncropped or reduced-growth channel-side margin are visible. (C) On 25 October, brown to red-brown standing water occupies a substantial part of the cropped field.*

Condition on 14 August 2018

The August 2018 image shows the main field again supporting vegetation, with no comparable field-scale open-water body visible. This demonstrates that the October 2017 expression was not permanently visible in the same form.

The broad curved strip beside the channel remains distinct from the vegetated field interior. It is largely bare, recently worked or supports substantially reduced growth. Small irregular dark or exposed features are visible within this strip and within parts of the adjoining fields. The opposite bank and adjacent Location 4 ground contain small irregular breaks and locally scarp-like forms.

The return of vegetation across much of the field is therefore evidence of later surface recovery or agricultural reuse, but does not establish that the earlier water sensitivity or associated ground condition had resolved.

Condition on 16 July 2026

The July 2026 images show the field after cutting or harvest under dry summer conditions. Regular agricultural rows are visible across the field, but the surface is not tonally uniform.

A broad irregular pale to reddish area occupies the channel-side sector affected by the earlier water expression. Within and around this area are numerous discrete dark, pale or exposed surface features. Several appear to interrupt or extend across the regular cultivation lines rather than conforming wholly to them.

The wider image confirms that the differentiated area is field-scale and is not limited to a single isolated patch. The DNG-derived view shows a stronger red or red-brown tonal response within the highlighted sector than across much of the surrounding field. It also resolves numerous small irregular points and short disturbed-looking forms.

The DNG response is recorded as an image characteristic only. It does not identify iron, salinity, contamination, sediment type or any other chemical property. Camera processing, white balance, illumination, crop residue, exposed soil and moisture differences may all contribute to the tonal appearance. DNG spectroscopy may prove useful in distinguishing the spatial persistence.

Figure 5. *Later field condition and annotated surface detail. (A) The 14 August 2018 view shows the field again vegetated, while the broad channel-side strip remains distinct; arrows indicate selected irregular field and bank expressions for inspection. (B) The 16 July 2026 wide view records a broad differentiated sector beside the channel, outlined as a locational aid, together with additional discrete features. (C) The DNG-derived detail shows a pronounced red to red-brown tonal response and multiple small irregular surface features. Arrows and the box are interpretive aids rather than measurements.*

Temporal comparison

The sequence records several related but non-identical expressions within the same field and drainage-margin setting.

On 12 October 2017, red-brown vegetation and dark or brown-red fluid are visible before the later field-scale inundation. By 16 October, local wetness, discrete irregular ground features and a broad uncropped or poorly established margin are visible. On 25 October, extensive brown to red-brown standing water occupies much of the lower field.

By August 2018, open inundation is no longer apparent and the field has returned substantially to vegetated agricultural use. The channel-side strip nevertheless remains distinct, and irregular surface and bank forms remain visible. In July 2026, extensive open water is again absent, but a broad tonal response and numerous small surface disturbances are visible under dry, harvested conditions in the same general field sector.

coloured vegetation and fluid -> local wetness and surface disturbance -> extensive inundation -> later agricultural recovery with a persistent marginal distinction -> dry-condition tonal and surface differentiation

The imagery therefore does not record one continuously visible feature. It records a fixed landscape area expressing through several forms under differing hydrological, seasonal and agricultural conditions. This progression does not establish a common cause, but it gives greater evidential weight to the location than any one image would carry in isolation.

Relationship to the 2018–2022 LiDAR comparison

The 2018–2022 LiDAR-difference data provide an independent elevation-change comparison for PHF-BAL-002 and the adjoining Location 4 drainage setting. The location-specific extraction shows a spatially coherent area of negative relative elevation change extending across the western field sector and toward the shared drainage margin.

A queried raster cell within this area records a relative elevation difference of −0.228 m, equivalent to approximately 22.8 cm of negative change between the two LiDAR epochs. This is a local queried value and should not be interpreted as uniform lowering across the whole field.

A generated −0.12 m contour delineates a substantial part of the same negative-change feature. The contour encloses an irregular area extending across the field and toward the drainage boundary, demonstrating that the measured response is not confined to a single isolated raster cell. Smaller adjoining contour loops indicate additional local variation within the wider negative-change setting.

The geometry is relevant to the photographic sequence. The contoured negative-change area overlaps the wider field sector in which the archive records:

- red-brown vegetation and fluid in October 2017;
- subsequent extensive inundation;
- a persistent channel-side strip after floodwater recession;
- irregular ground and bank expressions; and
- later dry-condition tonal and surface differentiation.

The LiDAR data therefore strengthen the spatial evidence by showing that part of the repeatedly responsive field sector also underwent measurable negative relative elevation change between 2018 and 2022. The data do not establish when within that four-year interval the change occurred, whether it accumulated gradually or episodically, or whether the full measured difference represents ground-surface movement.

Potential influences on the LiDAR comparison include vegetation state, water surfaces, crop condition, acquisition differences, raster alignment and interpolation. Nevertheless, the −0.228 m queried value and the spatial extent enclosed by the −0.16 m contour are sufficiently large and organised to warrant location-specific verification rather than treatment as display colour alone.

The supported conclusion is that PHF-BAL-002 contains a coherent area of measurable negative relative elevation change spatially associated with the repeatedly water-sensitive and visually differentiated field margin adjoining Location 4. This correspondence does not identify a shared mechanism or hydraulic pathway, but it materially strengthens the case for repeat topographic survey and integrated investigation of the field and channel margins.

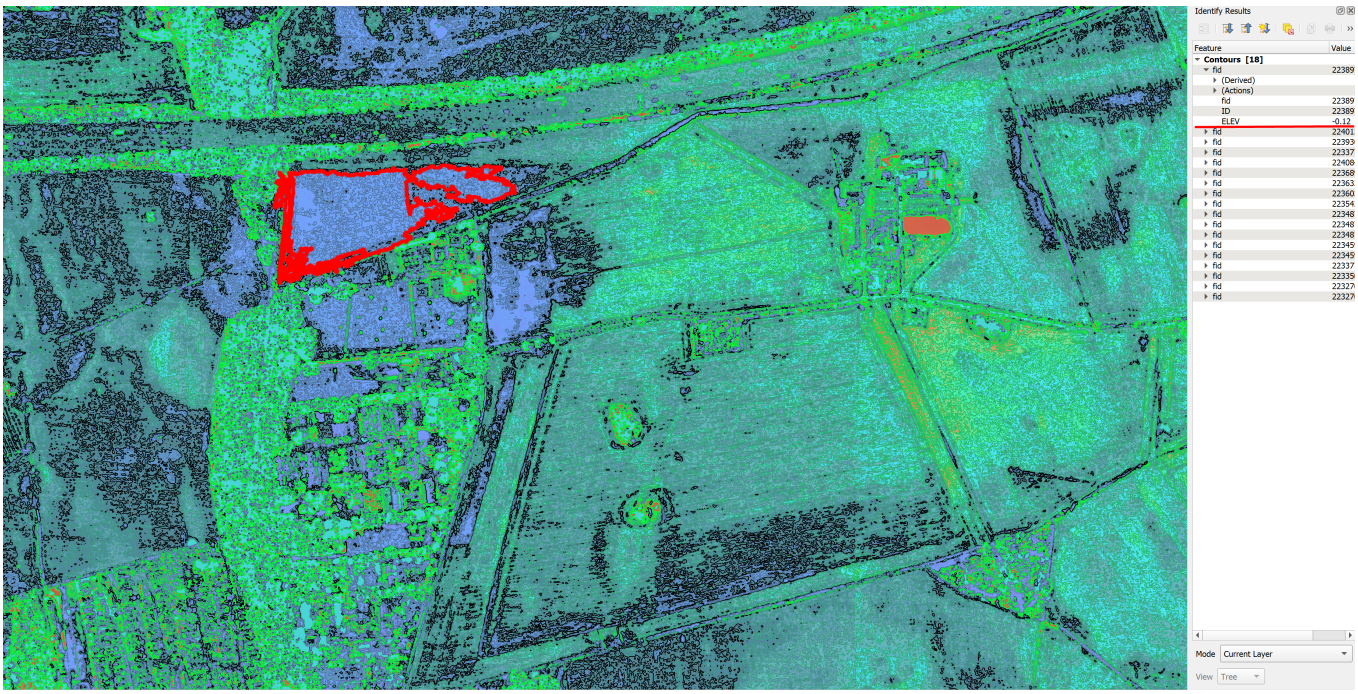


Figure 6. Location-specific 2018–2022 LiDAR-difference context for PHF-BAL-002 and the adjoining Location 4 drainage setting. *The highlighted −0.12 m contour delineates a substantial area of negative relative elevation change extending across the western field sector and toward the shared drainage margin. A queried raster cell within the feature records −0.228 m, equivalent to approximately 22.8 cm of negative relative change.*

Interpretation

Cautious interpretation

The sequence is spatially consistent with a persistently water-sensitive and ground-sensitive field margin. The co-occurrence of red or brown-toned water and vegetation, local surface disturbance, extensive inundation, a broad uncropped or reduced-growth strip, neighbouring scarp-like bank forms and later dry-condition surface differentiation raises the possibility that the location has experienced recurring shallow hydrological and ground-condition effects.

The field may form part of a connected shallow-groundwater or ground-adjustment system involving the adjoining channel and Location 4. That possibility is not provable by the imagery alone.

The later July 2026 surface response is not treated as a direct continuation of the October 2017 floodwater. Its significance lies in the recurrence of visible differentiation within the same field sector under very different surface and weather conditions.

Relationship to the working hypothesis

The location contains several manifestation classes anticipated by the current working hypothesis: water and vegetation colour change; sediment-like or turbid water expression; localised ground disturbance; scarp-like channel-margin forms; altered or absent vegetation; and persistence of spatial differentiation after the disappearance of open water.

The sequence is therefore consistent with the hypothesis at the level of pattern and spatial organisation. Rigorous tests will either confirm or deny.

Alternatives and visibility limitations

Several ordinary or local explanations remain viable and may operate together.

The October inundation may reflect heavy rainfall, overland runoff, channel exceedance, restricted drainage, blocked field drains, natural microtopography or saturated soil. The brown-red appearance may be produced by disturbed soil, suspended sediment, vegetation, reflected light or naturally iron-bearing material.

The broad channel-side strip may be a deliberately maintained agricultural headland, access for drainage or field machinery, ground left uncultivated because of wetness, an area of failed crop establishment, a product of compaction or repeated trafficking, or a combination of management and ground condition.

The small irregular features may include livestock disturbance, wheel marks, soil clods, local crop failure, exposed stones, drain-related works or genuine changes in surface geometry.

The opposite-bank forms may reflect ordinary erosion, trampling, vegetation loss, slumping or maintenance. Their relevance arises from their recurrence and proximity to other observations, not from morphology alone.

The 2026 harvested condition increases the visibility of soil and crop-residue variation but also introduces strong agricultural patterning. The DNG tonal response is affected by image rendering and cannot substitute for field sampling.

Relevance to the wider spatial pattern

PHF-BAL-002 is relevant because several manifestation classes occur within one narrow drainage setting and develop across time rather than appearing as a single isolated anomaly.

The sequence provides a direct spatial bridge between field-scale water and vegetation response, small surface disturbances within agricultural ground, persistent differentiation at a channel-side field margin, and the bank deformation and seepage-related observations already recorded at Location 4.

Similar forms occur elsewhere in the PHF-BAL corridor, including red or pale sediment expressions, stressed or absent vegetation, mounds, depressions, scarps and recurring wet ground. Their recurrence does not mean they all share one cause. It does support assessment at corridor scale and raises the possibility that some form part of a connected shallow-groundwater or ground-adjustment system.

- 1. Red to red-brown vegetation and dark or brown-red fluid are visible within the field and channel setting on 12 October 2017.
- 2. By 16 October, local wetness, discrete irregular surface features and a broad uncropped or reduced-growth field margin are visible.
- 3. On 25 October, extensive brown to red-brown standing water occupies a substantial part of the field.
- 4. By August 2018, the field has returned substantially to vegetated use, but the channel-side strip and adjacent bank remain visibly distinct.
- 5. In July 2026, under dry and harvested conditions, a broad pale to reddish field response and numerous small surface disturbances are visible within the same general sector.
- 6. The sequence is spatially consistent with recurrent water and ground sensitivity but does not establish source, mechanism, chemistry or hydraulic connection.
- 7. Its adjacency to Location 4 and position within the wider LiDAR context warrant integrated field inspection, topographic comparison and targeted water, sediment or soil testing.

5.2 Broader Gardeners Lower Fields chronology, 2017–2019

The Gardeners Lower Fields comprise a substantial agricultural and drainage-dependent landscape adjoining the M55, farm properties and the Main Drain/Location 4 corridor. The imagery assembled here covers field-scale flooding, drainage-sensitive ground, red-brown and pale vegetation or surface responses, bank and tree disturbance, circular or mound-like ground forms and later LiDAR-difference patterns.

The evidence is treated as a connected spatial record. The minimum working question is whether recurrent water, altered vegetation, bank response and ground forms are spatially consistent with a connected shallow-groundwater or ground-adjustment system.

- 5-16 October 2017 - fields largely present as vegetated and comparatively uniform; a fixed drainage-sensitive corridor and local wet ground are already visible.
- 23-25 November 2017 - field-scale flooding develops across the Main Drain-side fields and wider southern landscape; standing water is present beside Location 4.
- 13 January 2018 - saturated ground persists; variable channel-surface appearance, adjoining dark patches and a cluster of circular ground forms are recorded.
- 14 January-22 March 2018 - principal floodwater recedes, but red-brown field responses, residual standing water and mottling remain.

- August-October 2018 - fields appear recovered or otherwise in active use, while broad pale/mottled zones, scarp and tree disturbance, altered vegetation response and discrete drainage-margin forms remain visible.
- 22 September 2019 - localised disturbed ground persists within the Location 4 corridor.
- 2018–2022 LiDAR - spatially variable relative elevation change provides an independent comparison layer; it does not identify cause directly.

Early condition and drainage-sensitive corridor (October 2017)

The October sequence provides a necessary baseline. Surface water was present across the wider low-relief landscape, but much of the target field area remained green and comparatively continuous. Within that generally normal condition, one discontinuous linear-to-curving sector repeatedly presented as wet, dark, reflective or reduced in growth near an identifiable drainage channel and power-line reference.

Figure 7. *Early landscape context, 5 and 14 October 2017. The Gardeners Lower Fields are largely vegetated and comparatively uniform, while standing water is visible at several points within the wider low-relief landscape. The second panel provides cross-M55 hydrological context during a wetter phase.*

Figure 8. Early field-surface and water expressions on 14 October 2017. A narrow dark linear feature crosses the field, while a discontinuous broader corridor of shallow water and saturated or reduced-growth ground is visible within otherwise continuous vegetation.

Figure 9. Drainage-channel and field relationship on 16 October 2017. The visible channel, utility poles, field interior and M55 provide stable references. A dark wet or bare strip is present beside parts of the channel.

The early wet corridor should not be described as a fissure or failed drain on imagery alone. It is spatially compatible with a buried or surface drainage line, a natural hollow, water following compacted ground, or preferential shallow

saturation. Its evidential value lies in its fixed geometry and later correspondence with a more negative LiDAR-difference sector.

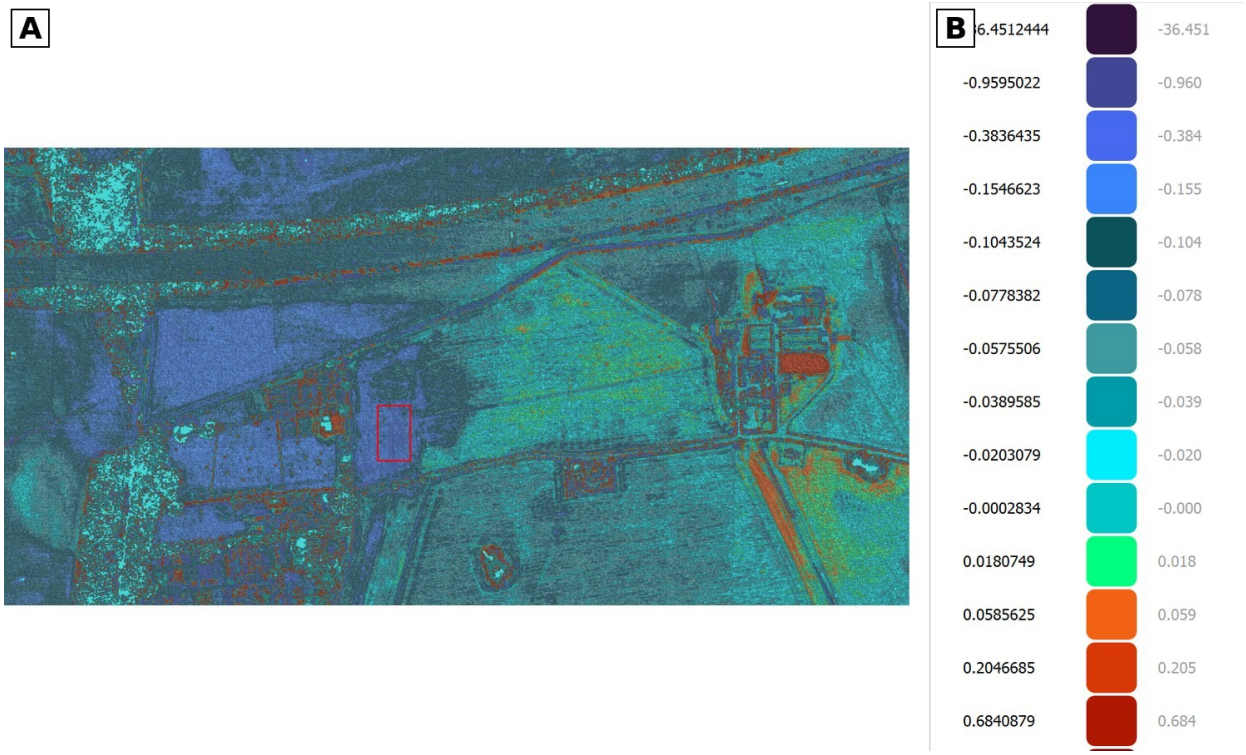


Figure 10. *Local 2018–2022 LiDAR-difference context and symbology. The highlighted field sector occupies negative relative-elevation-change classes compared with much of the adjoining cyan/teal area. Exact values require raster query; display colour alone is not used to assign a local magnitude or cause. Red box denotes area in Figure 8b*

Developed flooding and persistent saturation (November 2017-January 2018)

By 23 November 2017, the early drainage-sensitive condition had developed into a landscape-scale flood record. Water occupied large parts of the Main Drain-side field, extended through lower boundaries and occurred as sheets, branching corridors and isolated pools across the southern landscape. This confirms a period of strong hydrological loading and provides an important control against which later persistent or dry-condition features can be compared.

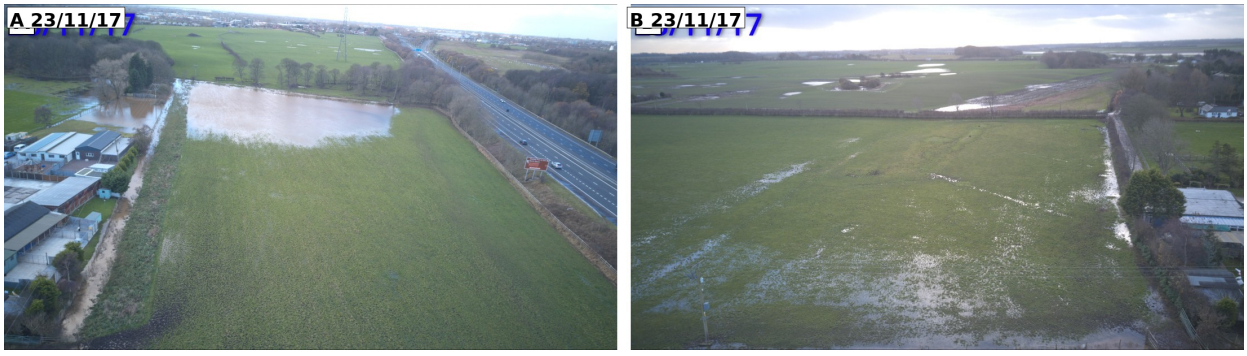


Figure 11. *Field-scale flooding on 23 November 2017. Pale brown standing water occupies a substantial part of the Main Drain-side field and extends through adjoining lower ground. The south-facing view (B) records widespread sheet ponding, boundary-aligned accumulation and narrower wet corridors across several fields, later covered in. PHF-BAL-003 & PHF-BAL-004*

Figure 12. Standing water east of the drain on 23 November and the Location 4 corridor on 25 November 2017. The Main Drain contains pale brown to reddish-brown water, with a broad area of standing water immediately opposite on the Gardeners Lower Fields side. The panels record close spatial and temporal adjacency.

The Location 4 corridor is especially relevant because loaded channel conditions, field saturation on the Gardeners Lower Fields side and the bank/scarp setting occur within one narrow spatial unit. The imagery demonstrates adjacency.

Figure 13. *Conditions on 13 January 2018. Shallow standing water or saturated ground persists beside the Main Drain, whose surface displays variable blue-grey and locally multi-tonal reflections. Near the M55 margin, a localised cluster of circular and sub-circular brown ground forms is visible. This is from DJI_0223 that is visible in the following figure. Iridescence is visible in the Main Drain (A)*

Figure 14. *2025 Google Earth locator for the January 2018 circular-form group and the wider Gardeners Lower Fields/Main Drain setting. The later image is used for spatial reference.*

The January circular-form group is described conservatively. The close image confirms discrete circular ground forms. Mole activity, animal disturbance, deposited soil, bare vegetation patches and shallow ground response remain alternatives.

Post-flood colour, vegetation and ground response (January-March 2018)

Following recession of the principal floodwater, the field did not immediately return to a uniform condition. Red-brown and yellow-brown tonal responses remained close to the former inundation margin and later expanded across a

broader central field area. Residual standing water and mottling were still present beside the Location 4 corridor in March.

Figure 15. *Post-flood field response on 14 January and 10 March 2018. An elongated red-brown expression remains near the former inundation margin in January. By March, a broader red-brown to yellow-brown tonal response extends through the central field.*

Figure 16. *Residual water, mottling and later field-scale manifestations, 22 March and 9 August 2018. The Location 4-side field remains spatially differentiated after principal floodwater recedes. In August, broad pale and mottled zones remain visible under vegetated conditions, with irregular boundaries not wholly explained by one simple parallel machinery pattern.*

Colour is recorded as an observational class only. Seasonal crop development, soil moisture, exposed soil, nutrient status, illumination and natural iron-bearing sediment may contribute. The significance is temporal and spatial: the response follows documented water loading and recurs within the same field sectors.

Later condition: apparent recovery, scarps, vegetation response and discrete ground forms (August 2018-September 2019)

Later imagery shows fields in active agricultural use or with broadly continuous vegetation, but not a complete return to spatial uniformity. Pale and mottled zones remain visible in the middle field. At Location 4, scarp-like bank forms, fallen or collapsed tree material, wet ground at tree bases and a locally bright or strongly reflective vegetation response occur together.

Figure 17. *Location 4 relationship on 14 September 2018. The wider view records the bank/scarp corridor, fallen or collapsed tree material, bright or strongly reflective vegetation and wet ground at tree bases. The annotated close view identifies scarp-like forms and areas of altered vegetation response.*

The bright vegetation response is relevant because of its immediate relationship to the bank, trees and drainage margin and the later development of other disturbances in the same landscape.

Figure 18. *Apparent recovery with persistent mottling and channel-side disturbance on 5 October 2018. Although the fields have broadly continuous green cover, diffuse pale areas remain. Beside the power pole and drainage channel, an irregular strip of pale, brown and locally exposed-looking ground contains multiple darker points.*

Figure 19. *Close views of the power-pole and drainage-margin sector on 5 October 2018. The field contains broad low-contrast mottling and irregular small patches. At the channel margin, flattened or strongly oriented vegetation, small exposed/dead-looking areas and similar manifestations on both sides are visible. Relief is not measurable; the images do not resolve whether individual forms are mounds, dead vegetation, trampling or shallow ground disturbance.*

The close views refine the earlier description. They support an irregular drainage-margin strip with flattened or strongly oriented vegetation, small exposed or dead-looking areas and low-contrast mottling on both sides of the channel. They do not reliably distinguish mounds from dead vegetation or shallow depressions.

Figure 20. *Drainage-area manifestations on 5 October 2018. The cultivated field contains readily identifiable parallel agricultural lines, while the pasture and drainage margin show less regular pale, brown and mottled expressions. The oblique view records several small mound-like or exposed forms near the channel, but their relief and origin remain uncertain.*

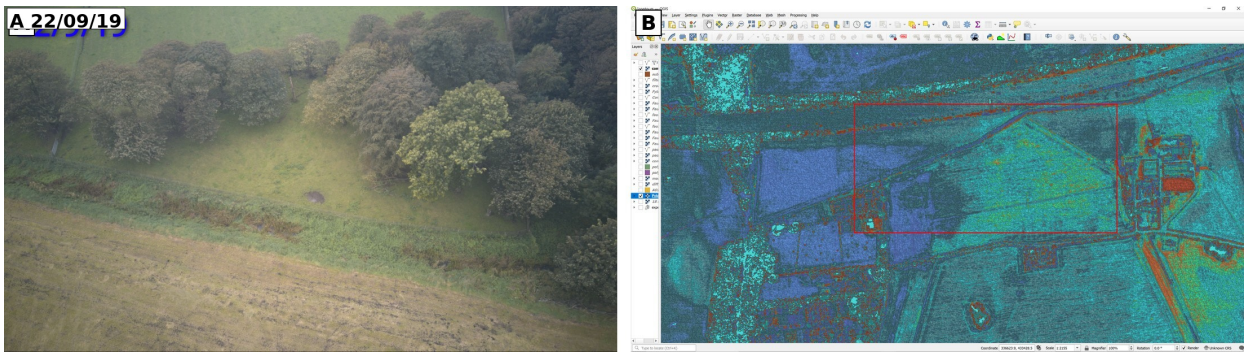


Figure 21. Later Location 4 disturbance on 22 September 2019 and wider 2018–2022 LiDAR-difference context. A discrete dark sub-circular disturbed area occurs near the channel margin, with fallen or inclined tree material nearby. The LiDAR display provides an independent comparison of spatially variable relative elevation change across the wider unit.

LiDAR relationship

The 2018–2022 LiDAR-difference display shows that Gardeners Lower Fields do not occupy one uniform change class. Stronger negative classes occur across parts of the western block, while central and eastern fields contain mixed modest-negative, near-zero and locally positive values. Local darker negative areas occur near some margins and developed land.

This spatial variation is relevant because the photographic archive independently records recurring water, vegetation and ground manifestations within the same broader unit. LiDAR cannot diagnose settlement, consolidation, shrink-swell, drainage change, fines migration, vegetation artefact or land-management effects.

5.3 Expanded 2019–2026 chronology

Expanded pre-flood condition and hydrological transition (September-October 2019)

The additional 2019 imagery changes the role of 22 September within the chronology. It is not merely a late isolated Location 4 observation. Before the documented October flooding, several adjoining field sectors already showed spatial differentiation: a broad irregular block of taller, paler or rougher vegetation in the western field; dark lines and discrete forms within the drainage-side field; and manifestations on both sides of the tributary. These are recorded as pre-flood conditions. They do not establish water source, material movement or one shared mechanism.

Figure 22. *Pre-flood field condition on 22 September 2019. The western field adjoining Location 4 contains a sharply differentiated area of taller, paler or rougher vegetation with several discrete darker forms. In the drainage-side field, dark lines, shorter irregular marks and broad mottling occur within a less uniform sector. Agricultural trafficking, management, crop condition and moisture remain possible contributors.*

Figure 23. *Cross-tributary relationship on 22 September 2019. Dark points, short irregular surface expressions and vegetation differentiation are visible near both margins of the drainage tributary. Their occurrence on both sides does not establish a hydraulic pathway, but supports assessment of the margins as one spatial setting rather than isolated field patches.*

On 11 October 2019 the middle cultivated field was extensively inundated. Standing water formed a broad sheet and occupied numerous cultivation or trafficking lines, with a larger pool beside the cattery boundary. Water was also present at several points across the wider landscape. The image provides a strong hydrological-loading event against which the rapid recession and residual surface condition can be compared.

Figure 24. *Extensive inundation on 11 October 2019. Pale brown standing water occupies a substantial part of the middle cultivated field, including a broad interconnected sheet, cultivation or trafficking lines and a larger pool beside the engineered boundary. The adjacent green field remains substantially less inundated, while wider landscape ponding is also visible.*

By 15 October, most of the open field-scale water had receded. The exposed cultivated surface remained strongly differentiated by residual reflective patches, pale-grey and brown areas, dark trafficking lines, green strips and numerous small dark forms. The four-day interval is important: it records rapid recession from a known flood state into a residual surface condition, but does not by itself identify whether the remaining material is sediment, wet soil, crop residue, organic film or another agricultural or hydrological effect.

Figure 25. *Flood recession and residual surface condition on 15 October 2019. The wider view shows substantial reduction in open water compared with 11 October, while reflective wet patches, pale-brown ground, dark lines and multiple discrete forms remain. The closer oblique view records their concentration beside the drainage-side margin.*

Figure 26. *Discrete dark forms within the recently inundated cultivated field on 15 October 2019. Numerous circular to irregular marks occur within a broad pale-brown drainage-side band and across agricultural lines. The imagery does not establish whether individual forms are raised, depressed or flat. Soil clods, crop residue, animal disturbance, trafficking-related displacement and local wet-ground response remain alternatives.*

A distinct manifestation category was recorded in the grassed western field beside Location 4. Shallow standing water remained over part of the field, while cream-coloured material occurred beside the irregular channel margin and in discontinuous patches farther into the grass.

Figure 27. *Location 4 and western-field condition on 15 October 2019. The left panel records shallow standing water beside the irregular channel margin, pale channel-side expressions, fallen tree material and cream-coloured patches within the grass. The right panel shows that part of the cream-coloured material is fibrous or matted rather than a simple bright reflection.*

Figure 28. *Wider distribution of cream-coloured fibrous or matted material on 15 October 2019. Discontinuous, locally curving or branching patches extend through the grassed field, including locations away from the visible channel edge. Dead or flattened vegetation, flood-deposited plant material, organic residue, sediment mixed with vegetation and agricultural treatment remain possible explanations.*

Later dry-season condition and localised disturbance (July 2024)

The July 2024 images provide a later summer comparison under substantially greener and less visibly saturated conditions. Much of the landscape is in active agricultural use, yet localised dark, pale and reduced-cover sectors remain visible. The most legible examples include an irregular disturbed area in the western field and elongated or branching crop expressions in the adjoining green field. These features are relevant because they occur within sectors previously affected by water and later winter differentiation.

Figure 29. *Gardeners Lower Fields on 5 July 2024. The wider view records a localised dark and pale disturbed sector within the western field. In the adjoining green field, elongated and branching darker or flattened crop expressions occur away from the immediate field edge. Crop stage, wheelings, cutting, compaction, drainage and local working remain alternatives.*

Figure 30. *July 2024 detail views. The left panel shows darker linear tears or reduced-cover expressions within a concentrated disturbed patch. The right panel shows an elongated darker field response with adjacent pale areas and curved crop deformation. The images establish surface differentiation but do not determine relief, depth or cause.*

Winter recurrence and developed field differentiation (December 2025-January 2026)

The winter 2025-26 sequence records renewed and more extensive wetness, staining and ground differentiation. On 26 December 2025, standing water and saturated tracks occupied the middle field, with broad darker and paler sectors extending beyond the open pools. The opposite side of the tributary remained greener but also contained discrete dark marks and local surface variation. The contrast supports comparison across the visible drain without proving subsurface connection.

Figure 31. *Winter field condition on 26 December 2025. The middle field contains standing water, saturated trafficking lines, broad darkened sectors and irregular pale margins. The paired view shows the tributary between the affected cultivated field and a greener adjoining field containing separate dark marks and localised surface disturbance.*

By 10 January 2026, some sectors appeared greener and less openly inundated, but the field remained spatially differentiated. Dark points, curved alignments, irregular wet-looking forms and a large sharply bounded dark area with a pale scalloped margin were visible in the middle field. Agricultural vehicle movements are prominent and must be separated from less regular expressions.

Figure 32. *Wider condition on 10 January 2026. The left panel shows the Gardeners Lower Fields, Main Drain and Location 4 corridor under winter conditions. The right panel records the wider middle field, including darkened ground, local wet areas and a sharply differentiated sector beside the drain.*

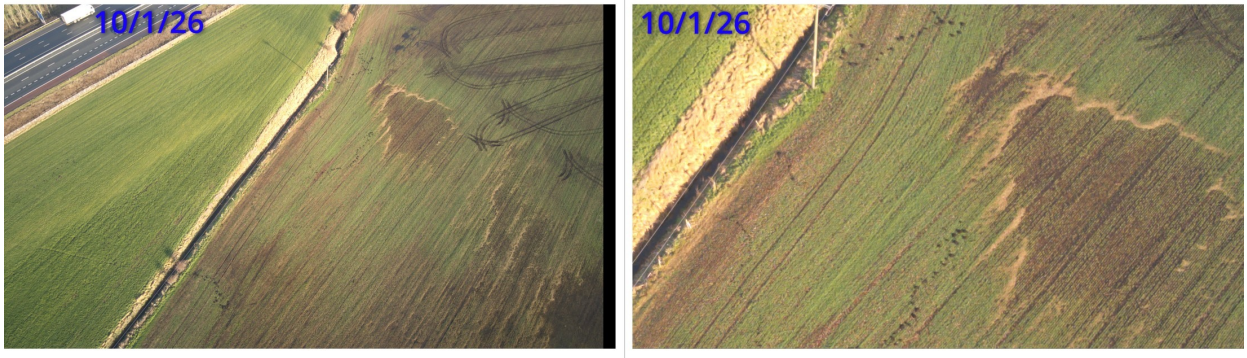


Figure 33. *Large differentiated field sector on 10 January 2026. The full view and close detail show a dark internal area bounded by an irregular pale or cream-coloured scalloped margin, with nearby discrete dark forms and agricultural lines crossing the surrounding surface. The image does not establish whether the boundary represents dead vegetation, exposed soil, deposited material, crop response or differential saturation.*

The Main Drain margin also shows locally irregular or recessed bank geometry. Immediately behind it, discrete dark forms and intersecting field marks occur within a broader differentiated belt. The close views make the spatial relationship legible, but the imagery alone cannot determine whether the bank form reflects ordinary erosion, livestock access, maintenance, local collapse or ground adjustment.

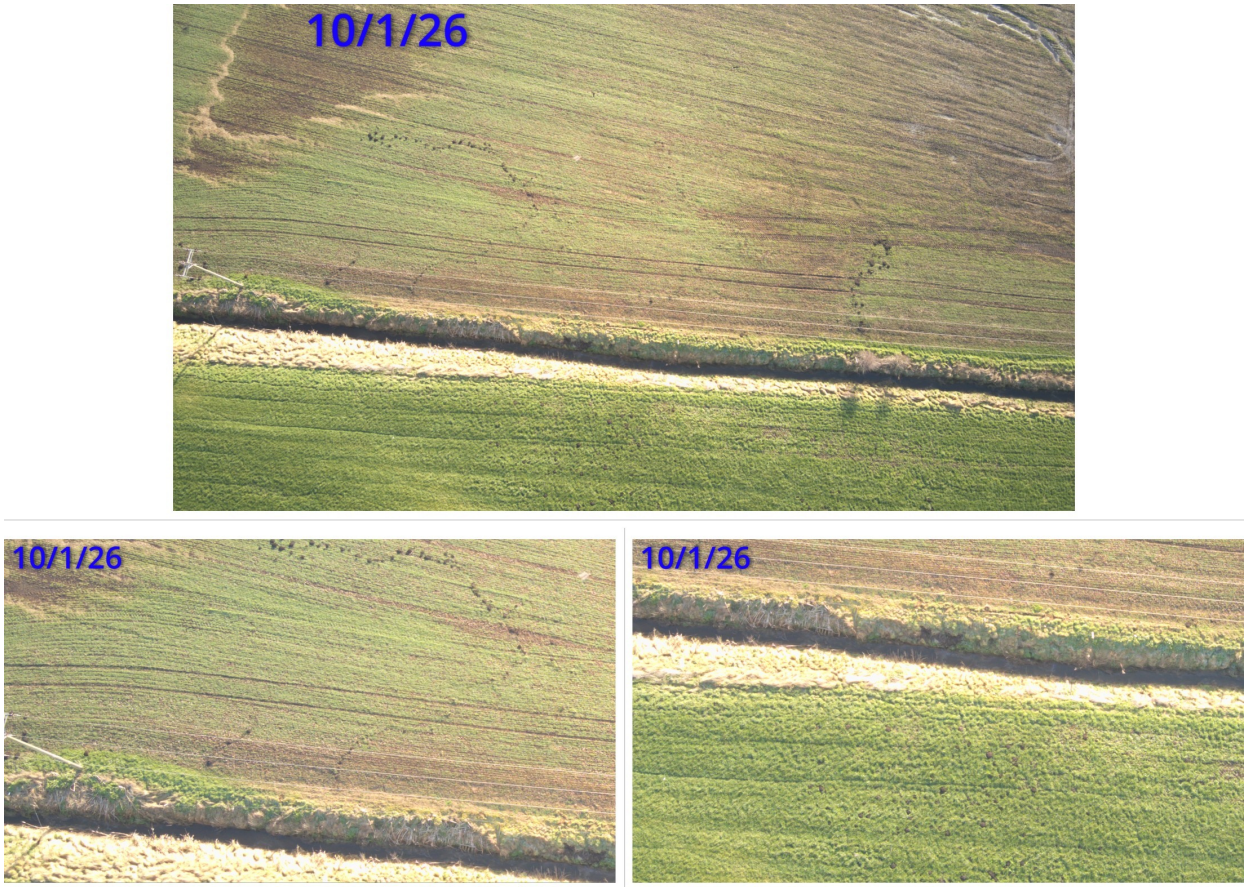


Figure 34. *Main Drain bank and adjoining field forms on 10 January 2026. The upper panel provides the full channel, bank and field relationship. The lower details show locally irregular or recessed bank geometry and clusters of discrete dark forms behind the drain.*

On 21 January 2026, extensive fluid reflectance is visible in the middle field, particularly near the residential edge and former wet sectors. The field-scale pattern is broader than a single isolated pool and includes multiple discontinuous pale areas, dark trafficking lines and locally reflective ground.

Figure 35. *Later January 2026 condition. The wide view records extensive water saturation, dark trafficking lines and residual wet-looking areas across the middle field. The detail panel shows the fluid reflection near the residential edge.*

Temporal synthesis

The expanded archive now supports the following observational sequence:

- By 22 September 2019, field-scale differentiation, drainage-side mottling, cross-tributary manifestations and a sharply differentiated western-field vegetation block were already present before the documented October flood.
- On 11 October 2019, extensive pale brown water occupied the middle field and multiple cultivation or trafficking lines during a wider landscape wet period.
- By 15 October 2019, most open water had receded, leaving residual reflective ground, pale-brown surface differentiation, numerous discrete dark forms and cream-coloured fibrous or matted material in the neighbouring grassed field.
- In July 2024, localised disturbance remained visible under summer growth, including a concentrated dark and pale sector and elongated or branching crop expressions.
- In December 2025 and January 2026, renewed winter wetness was accompanied by broad darkened sectors, sharply bounded pale margins, bank irregularity, discrete field forms and extensive pale or white surface differentiation.

The sequence is spatially consistent with the possibility that ordinary flood routing, drainage limitation, shallow groundwater behaviour and ground response interact across the Gardeners Lower Fields and Location 4 corridor. It does not establish hydraulic connectivity, material source, chemical composition, operational origin or one mechanism for every manifestation.

Interpretation, alternatives and LiDAR relationship

The strongest evidential contribution is temporal rather than diagnostic. Several manifestations precede the October 2019 flood, others become clearer during recession, and related categories recur under later summer and winter conditions. This raises the possibility that flooding exposes or intensifies pre-existing drainage- or ground-sensitive sectors, rather than creating every later feature from nothing.

Ordinary alternatives remain. Agricultural trafficking, cultivation, crop establishment, mowing, grazing, drainage maintenance, nutrient variation, compaction, natural low ground, soil clods, mole or livestock activity, bank erosion and illumination can explain individual elements of the record. Flood-deposited vegetation, dead or flattened grass, organic residue and fine sediment may explain the cream and pale material. The imagery does not permit composition or relief to be assigned confidently.

The 2018–2022 LiDAR-difference layer remains an independent comparison only. It records spatially variable relative elevation change across the wider unit, including more negative sectors, but does not diagnose settlement, consolidation, shrink-swell, drainage change, fines migration or vegetation artefact alone. The 2024-26 photographs post-date the available LiDAR comparison; updated topographic data would therefore be especially valuable.

A proportionate field response would combine repeat topographic survey with mapped drains and bank profiles, matched wet- and dry-condition photography, and targeted soil, sediment and water sampling at recurring manifestations and unaffected controls. The large scalloped-boundary sector, the Main Drain bank, the 2019 post-flood discrete-form belt and the cream-coloured grass expressions are priority comparison locations. Updated LiDAR or equivalent elevation data should be analysed using fixed polygons and stable controls before any local magnitude or causal claim is made.

Taken together, PHF-BAL-002 records an early fixed drainage-sensitive corridor; field-scale flooding and Main Drain loading; residual red-brown, pale and mottled response after open water recedes; later bank, tree and drainage-margin disturbance; pre-flood differentiation before the October 2019 inundation; rapid recession into discrete dark forms and cream-coloured fibrous or matted material; and recurrence under summer 2024 and winter 2025–2026 conditions. The sequence supports integrated assessment of the field, drain and bank as one spatial setting.

6. PHF-BAL-003 — First southward field

Spatial and topographic context

The 2018–2022 LiDAR difference view places this field immediately south of the previously examined location. Google Earth measurements place the Preston New Road pad approximately 1 km to the north-east and around five metres higher than the field. In the supplied Google Earth locator, the red box marks the present location and the cyan box marks the next field considered in the southward sequence. The boxes are locational aids rather than measured boundaries.

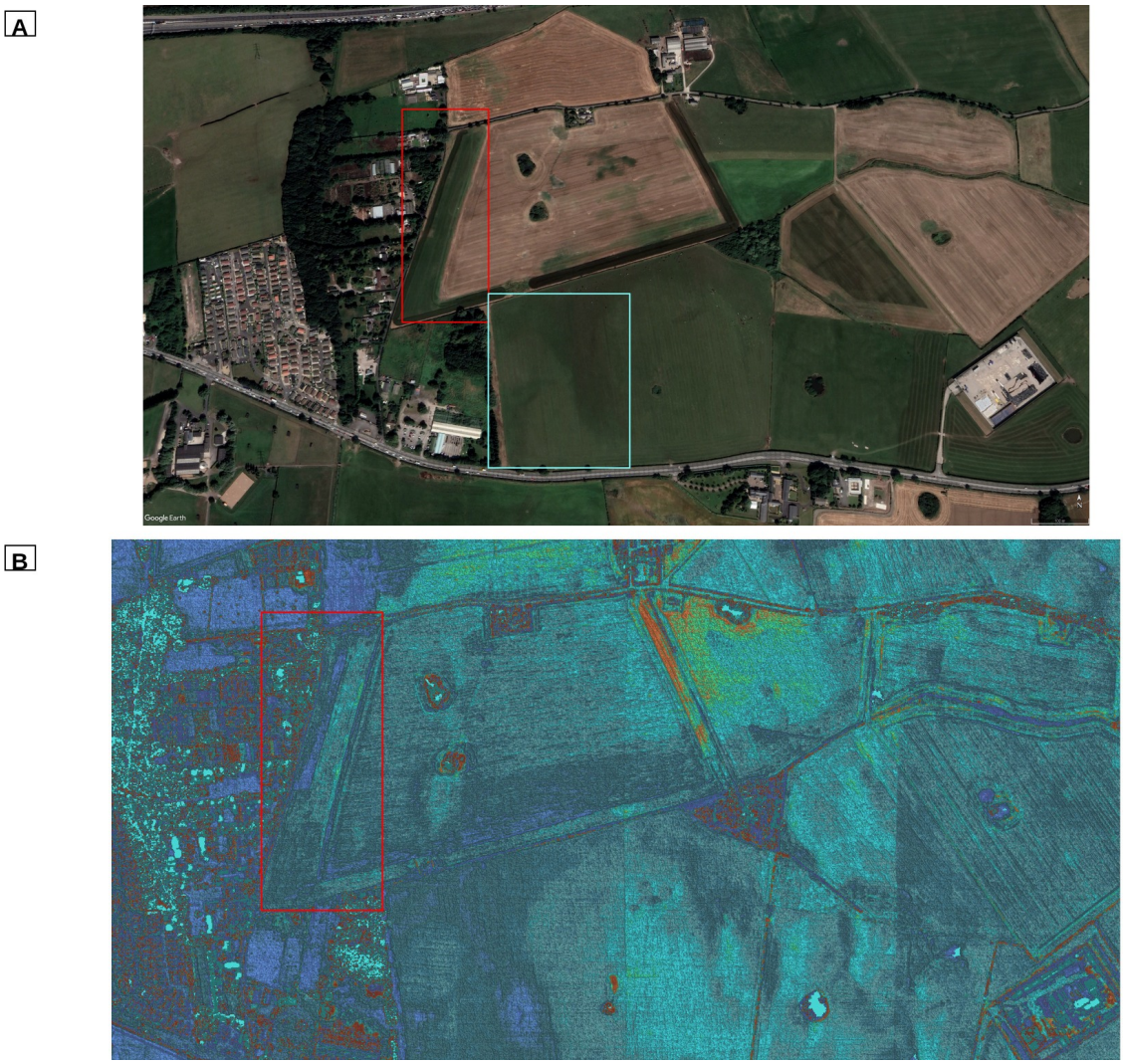


Figure 36. *Spatial context for the first southward field. (A) Google Earth locator with the present field outlined in red and the next field outlined in cyan. (B) 2018–2022 LiDAR-difference view placing the present field within the wider non-uniform elevation-change setting.*

Early condition, red-toned response and water expression

The August and September 2017 views establish a substantially vegetated field before the later water sequence. By 16 September, broad tonal differentiation is visible across the field and along its lower sector. The corrected working render improves legibility of the red-brown and pale response but does not alter the evidential limitation: colour may reflect vegetation, soil, moisture, illumination, camera processing or several effects together.

By 16 October, standing water is visible within the wider field setting and the central raised forms are more legible in relation to the surrounding surface. The sequence does not show one continuously open feature. It shows a field moving between comparatively uniform crop, red or brown-toned differentiation, local water expression and later mottling.

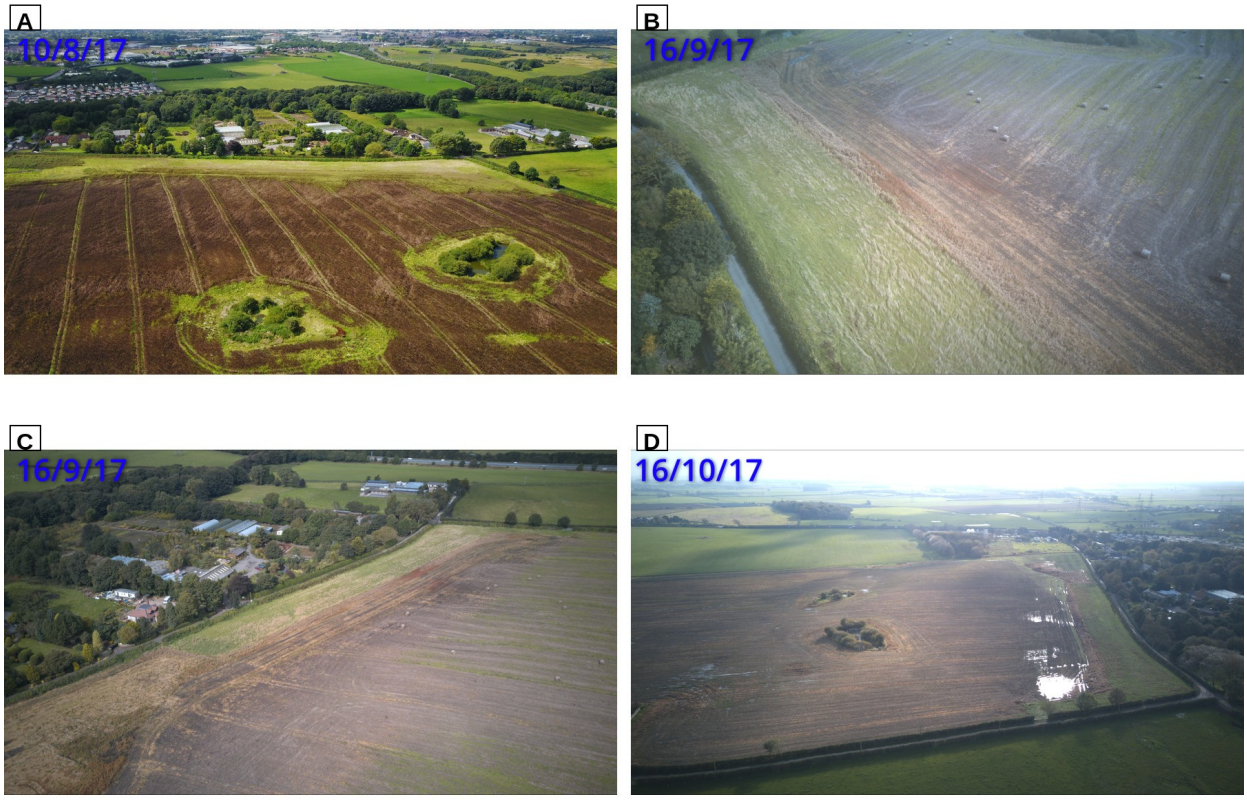


Figure 37. *Early temporal sequence in the first southward field. (A) 10 August 2017 wider condition. (B-C) Two views from 16 September 2017 showing field-scale tonal differentiation; panel B is the corrected working render. (D) 16 October 2017 wider view with standing water and the raised-field setting visible. The panels are temporal context rather than a fixed-camera measurement.*

2018 mottling and independent 2021 crop response

The 27 September 2018 frame records a marked contrast between adjoining field sectors and an internally mottled vegetation response. This image is useful because it post-dates the 2017 wet period and shows that spatial differentiation remains visible under a different crop and seasonal state.

Google Earth imagery from July and August 2021 supplies an independent, lower-resolution comparison. A spatially organised patch remains visible within the cropped field, although its sign changes with crop state and image acquisition: it appears darker in one view and comparatively greener in another. That behaviour is consistent with persistent crop or moisture differentiation, but satellite tone alone cannot distinguish water content from crop development, soil, management or processing. The field to the south also displays a darker, locally reddish tonal response within the area later associated with depressions and measured lowering.

Figure 38. *Later and independent comparison. (A) Mottled and differentiated field condition on 27 September 2018. (B-C) Google Earth views from July and August 2021 showing a recurring spatially organised crop response within the same wider field system. Differences in crop stage, illumination and image processing prevent direct colour comparison, other Satellite products may be suitable for such analysis.*

July 2026 field condition

The 9 July 2026 wide view appears comparatively green and orderly at first inspection. Closer examination shows an elongated line of reduced or stressed vegetation and a local concentration of dark point-like disturbances. The pattern is not identical to the earlier water or crop response, but it occupies the same wider field setting and resembles a manifestation class recorded elsewhere in the corridor.

The close view establishes local surface and vegetation differentiation but does not resolve whether each point is raised, depressed or flat. Livestock, wheelings, crop failure, stones, soil clods, local wetness and shallow ground disturbance remain possible contributors. Its significance is therefore relational: it follows the earlier wet and mottled sequence and occurs inside the LiDAR and Google Earth comparison area.

A

B

Figure 39. *July 2026 condition. (A) Wide 9 July 2026 view of the field and adjoining developed edge. (B) Closer view of the elongated stressed-vegetation line and clustered dark point-like disturbances. The close image supports inspection of morphology but not classification of relief or cause.*

Local synthesis

Taken together, the first southward field sequence records early crop differentiation, red-brown tonal response, standing water, later mottling, a recurring 2021 crop pattern and a 2026 line of stressed vegetation with point-like disturbance. No single panel establishes lowering or subsurface fluid movement. The combination is sufficient to justify repeat topographic measurement, review of field drainage and a fixed-point comparison of the central raised form and lower field margin.

7. PHF-BAL-004 — Intermediate field and drainage boundary

Early condition and development of a field-edge response

The next location provides a compact transition from a broadly uniform summer field to an increasingly differentiated field and drainage margin. The 7 August 2017 image establishes the wider initial condition. By 16 September, a pale or reduced-growth sector is visible across the field, and the 18 October view shows a stronger field-edge response near the wooded and drainage boundary.

Figure 40. *Early intermediate-field sequence. (A) Broad field condition on 7 August 2017. (B) Field-scale differentiation on 16 September 2017. (C) Stronger boundary and lower-field response on 18 October 2017.*

October 2017 drainage loading and inundation

The 12 October views place standing water, saturated ground and drainage-margin vegetation within the same local setting. By 25 October, open water is extensive across the wider landscape and within the field system. This is a hydrological loading event rather than evidence of source. It provides the necessary wet-state context for the later mottling and point-like manifestations.

Figure 41. October 2017 hydrological transition. (A-B) Top-down and wider views from 12 October showing standing water, saturated margins and the adjoining drainage corridor. (C) Wider 25 October view during landscape flooding. The sequence provides evidence of surface-water distribution and drainage performance for professional assessment.

Later vegetation response and winter point manifestations

By 19 November 2017 the open-water expression had reduced, while the field retained broad mottling, pale sectors and localised areas of reduced cover. The December 2025 views show a later, greener surface containing discrete dark exposed points and small clustered disturbances. The close image resolves a local group but does not establish whether the features are depressions, mounds, animal disturbance or exposed soil.

This sequence is important because the later point manifestations occur in a field already shown under wet loading and subsequent vegetation differentiation. The temporal relationship increases the priority for field inspection without proving that the forms share one mechanism.

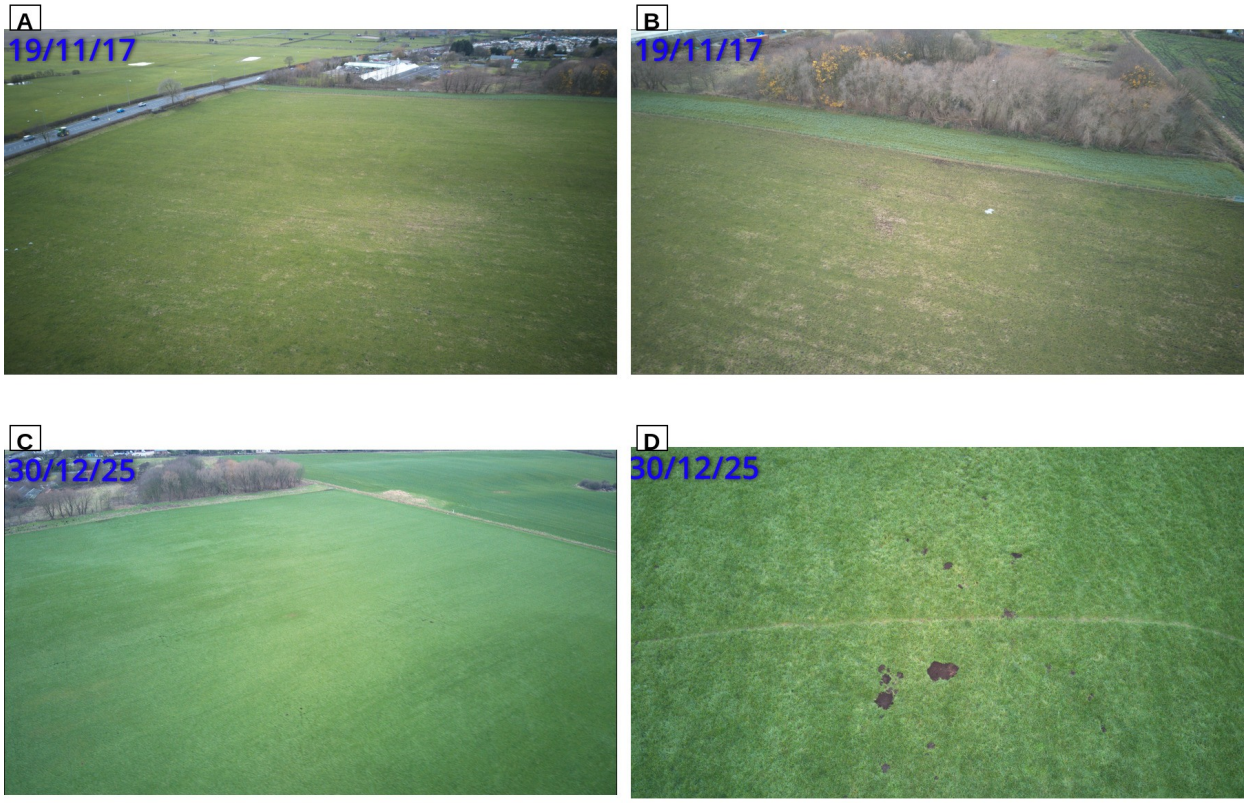


Figure 42. *Later intermediate-field condition. (A-B) Two 19 November 2017 views showing field-scale mottling and pale or reduced-cover sectors. (C-D) 30 December 2025 wide and close views showing discrete dark exposed points and localised ground disturbance within otherwise green cover.*

8. PHF-BAL-005 — Ground Adjustment Location 11 and Hex pond complex

Relationship to the Ground Adjustment report

The following sequence corresponds to Location 11 in the Ground Adjustment report. That report places Location 11 approximately 650 m west of the Preston New Road pad and identifies a cluster comprising the Hex pond, redistribution of water beyond the pond margin, shallow field depressions, an elongate zone of relative elevation change and bank collapse along Carr Bridge Brook. Gardeners Lower Fields, examined in Parts 1 and 2, corresponds separately to Location 5.

The present continuation adds a longer chronology and several manifestation classes not required for the earlier regulatory summary. The purpose is not to rewrite the Ground Adjustment report, but to connect its location-based observations to the wider PHF-BAL temporal sequence.

Hex pond overtopping and apparent outlet development

The Hex pond sequence records a separate but spatially related hydrological expression. On 30 December 2025, water extends beyond the pond enclosure into the field. The overtopping or escape path is visible as a narrow connection between the pond and the adjacent open-water area. A pale grey-brown deposit occurs within the lower part of the open-water feature, and small high-contrast particles are visible within it.

The close pond view shows an irregular internal water margin and a narrow, channel-like or piping-like surface expression leading away from the overtopped area. Soil piping is a possible morphology for comparison, not an established process. The July 2026 oblique view lacks close detail but confirms the pond and associated field sector remain available for repeat survey under a contrasting dry-season condition.

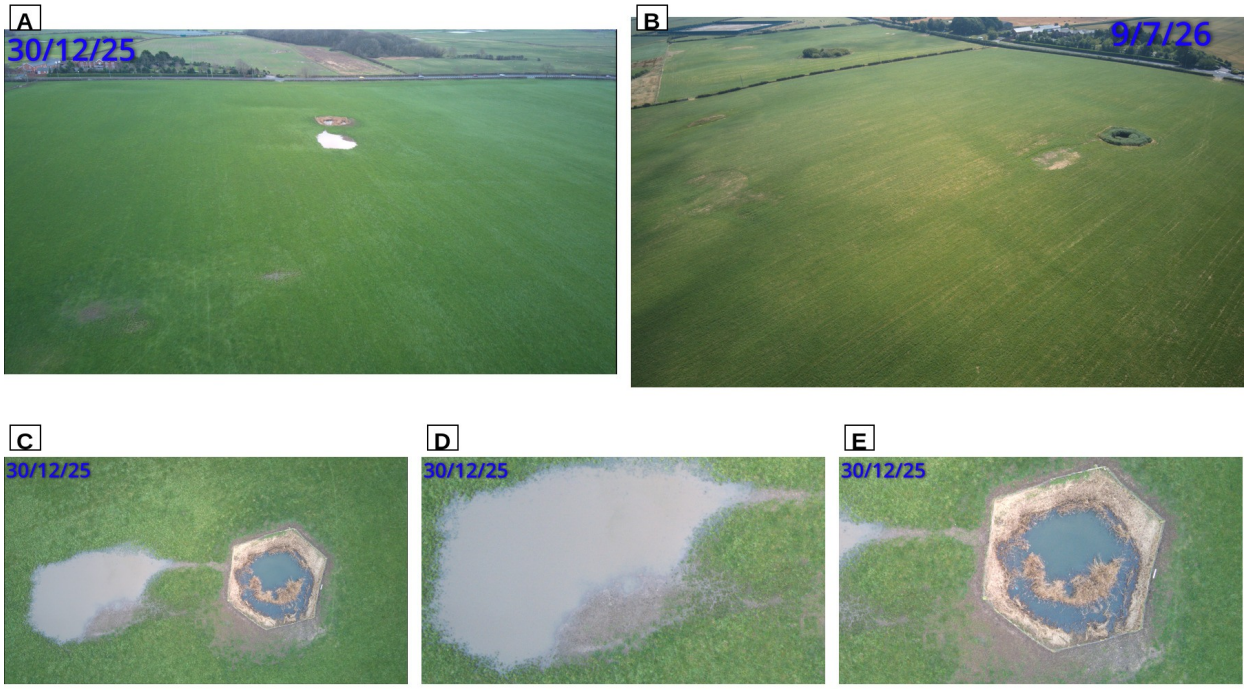


Figure 45. *Hex pond chronology and overtopping. (A) 30 December 2025 wider field view with open water beside the pond. (B) 9 July 2026 oblique context. (C) Top-down relationship between the pond and adjoining water. (D) Close view of the open-water area and pale grey-brown deposit. (E) Pond margin and apparent channel-like or piping-like surface expression. The images do not determine flow direction, material composition or mechanism.*

Location 11 depression, discrete emergences and LiDAR alignment

The field shown in the 9 July 2026 wide and close views corresponds to the DJI_0275 field discussed in the Ground Adjustment report. A broad pale and stressed-vegetation expression is visible, and the extreme crop shows small pale or cream point-source forms. Because the imagery does not resolve measurable relief, these are described as discrete emergences or splodge-type manifestations rather than mounds.

The LiDAR-difference panel shows relative elevation-change geometry extending in a direction that is not simply parallel to the visible ponding pattern. The field edge has also been reported and visually interpreted as lower through time. That divergence is important as a testable observation: it suggests the comparison should not be reduced to the footprint of one flood. It does not establish subsurface flow direction or the cause of the measured relative change.

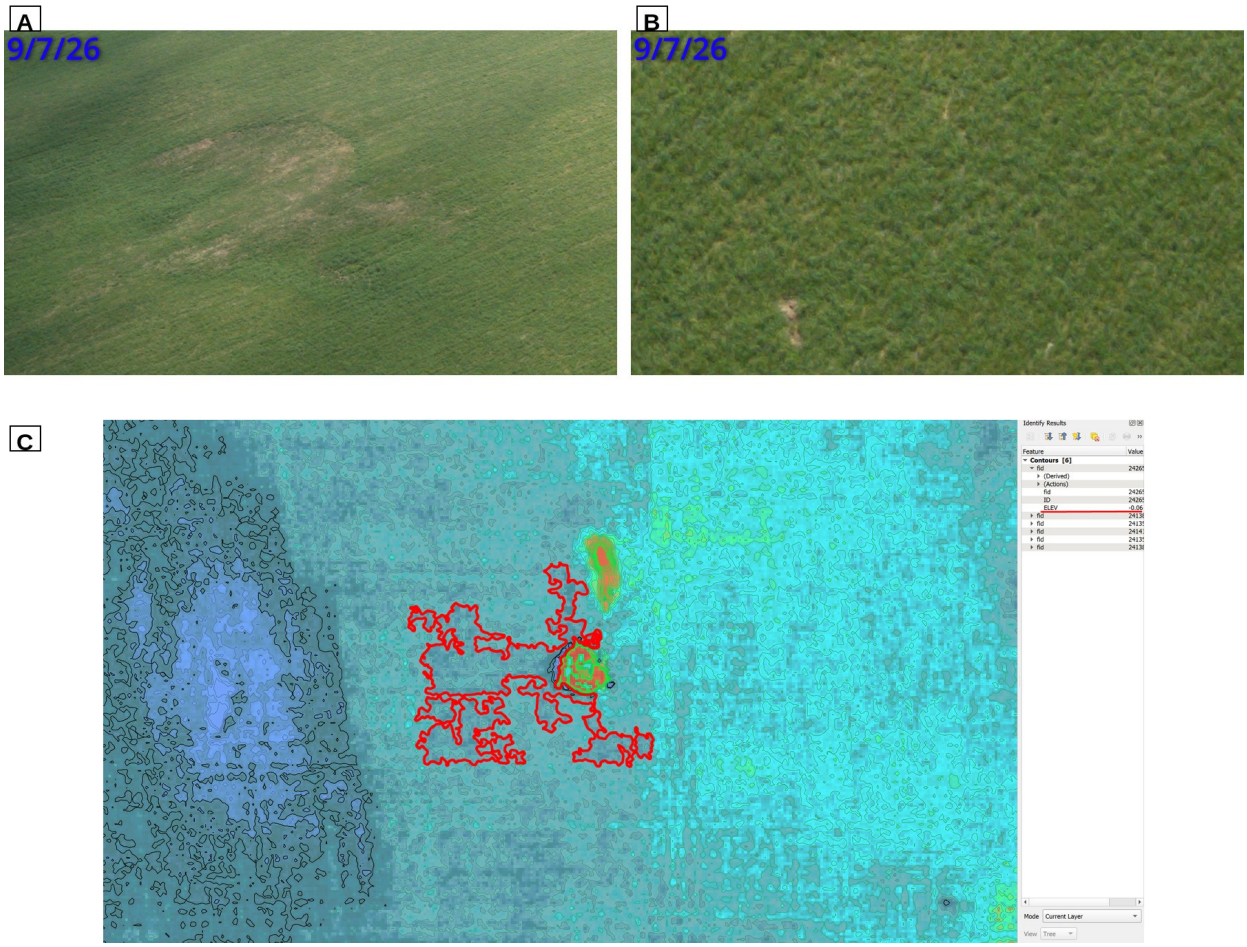


Figure 46. *Location 11 field and LiDAR comparison. (A) 9 July 2026 wide view of the pale and stressed field expression. (B) Extreme close view of small pale or cream and yellow discrete emergences within the vegetation. (C) 2018–2022 LiDAR-difference view and contours showing the wider elevation-change pattern. The contour selection is a visual aid, not a surveyed boundary.*

July 2026 expansion and PNR-1z spatial context

Wider distribution across the adjoining fields

The final July 2026 sequence broadens the evidence from individual points to the field system. The two wider views show extensive crop thinning and pale linear response, together with concentrations near the field boundary and drainage corridor. Related tonal and vegetation expressions occur on both sides of the field division. They do not terminate neatly at the agricultural boundary, although differing crops and management complicate direct comparison.

Figure 47. *Wider 9 July 2026 distribution. (A) Field-scale thinning and pale linear response. (B) Relationship between the adjoining fields, wooded boundary and developed edge. (C) Closer boundary view showing stressed crop and differentiated ground on both sides.*

Manifestation classes visible in close imagery

The closer frames show several overlapping surface classes: small dark exposed points; pale or cream discrete emergences; diffuse fan-shaped or branching patches; local red-brown staining; flattened or altered vegetation; and areas where the response crosses or interrupts regular crop lineation. The regular agricultural rows are useful as a reference grid, but they also create strong background patterning that must not be mistaken for deformation.

The working class splodge is retained for comparatively fluid-looking, pale to white or cream, low-relief manifestations with a discrete apparent origin and spreading or fan-like geometry. Mudboil is reserved for a visibly domed soil or mud uplift; sand boil for a wetter or granular pressure-release form; discrete emergence for a smaller point-source expression; and staining for colour alteration without an assumption of composition. Several July frames contain more than one class, and some features remain unclassified.

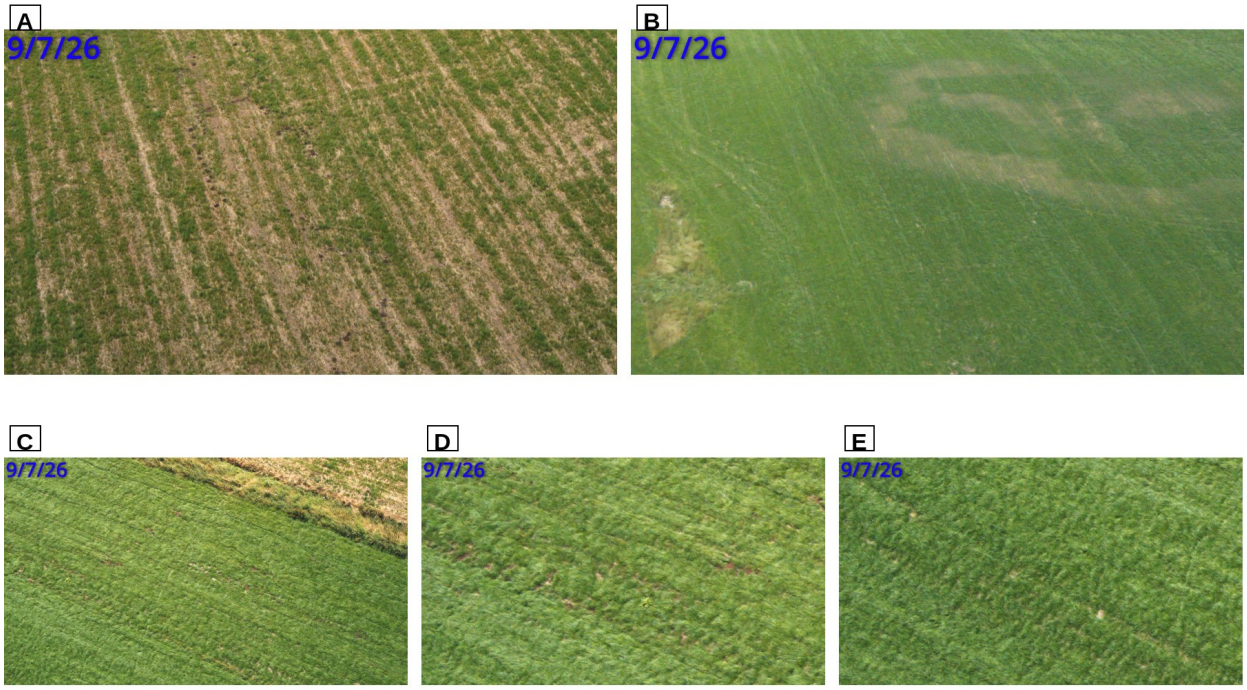


Figure 48. *Close 9 July 2026 manifestation sequence. (A) Pale and dark point-like forms within stressed crop. (B) Diffuse branching or fan-shaped pale response. (C-D) Local red-brown linear disturbance and closer detail. (E) Small pale discrete emergences within dense vegetation. The images support morphology-based triage but not material identification.*

PNR-1z fracture and induced-seismicity context

The supplied archived plan-view summary places the field sequence above or immediately adjacent to the mapped PNR-1z lateral and within the overlapping positional envelopes of several induced seismic events. The multicoloured lines represent mapped fracture-stage traces; the event circles indicate approximate location uncertainty. This is a spatial comparison layer.

The positional uncertainty is material. Broad and overlapping circles prevent exact one-to-one attribution, and the surface images do not supply depth information. The supported conclusion is narrower: an increasing and varied group of surface manifestations occurs within the documented operational and induced-seismicity corridor. That coincidence warrants integrated shallow-ground investigation.

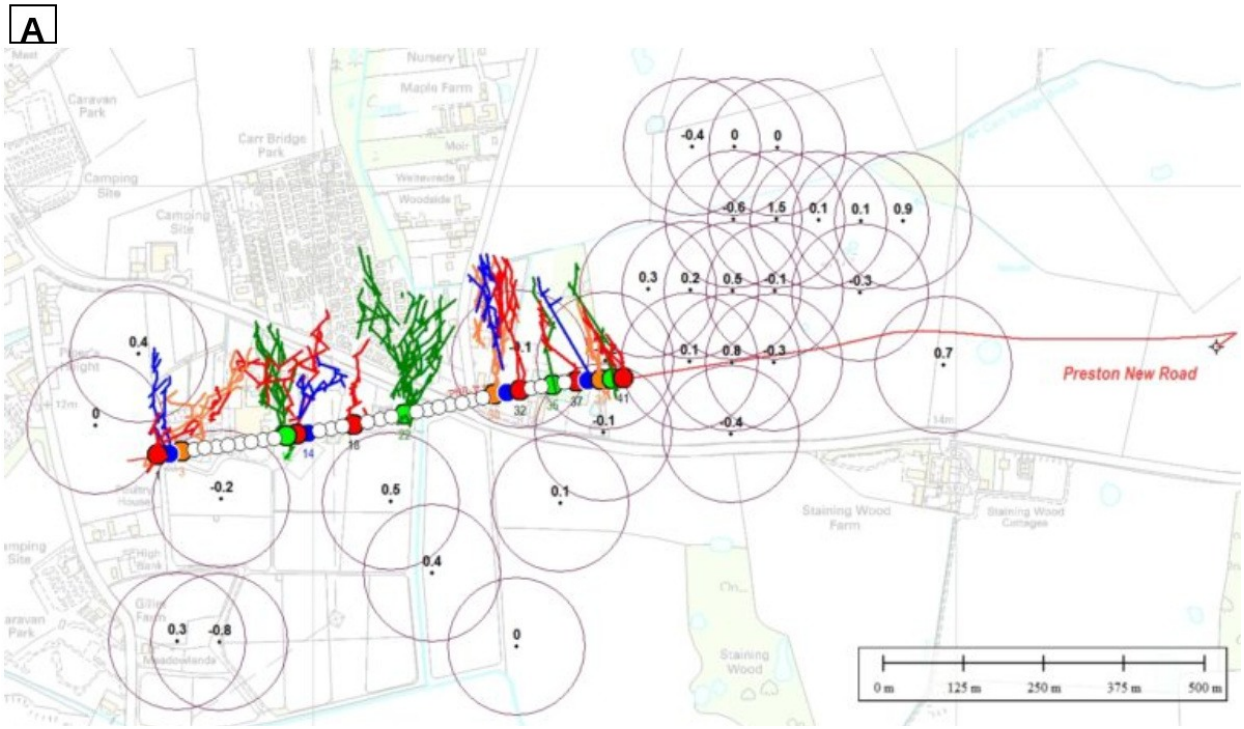


Figure 49. *PNR-1z operational and induced-seismicity context. The supplied archived map shows the PNR-1z lateral and fracture-stage traces together with induced-event locations and approximate uncertainty circles. The figure is used to establish plan-view spatial context only; it does not demonstrate vertical connection or causation alone.*

9. PHF-BAL-006 — Fields south of the Preston New Road/Moss House Lane junction

Temporal sequence from staining to flooding

The next field group lies immediately south of the Preston New Road/Moss House Lane junction and continues the sequence southeastward from the preceding locations. The 16 September 2017 imagery records several conspicuous dark to blue-black stained or tonally differentiated expression within the same wider field setting. In the closer view the response appears as an irregular dark patch with elongate extensions; in the wider view a separate areas of pooling resolves into a broader lobe within the field. The images identify a marked local surface or vegetation response but do not determine composition, source or duration.

By 25 October 2017 the same wider field system is inundated. Open water occupies a substantial part of the field and shows strong pale-brown and darker margins, locally resembling a flood-borne sediment or turbidity plume. This wet-state sequence is important because it places the later stressed field within a documented hydrological context. As elsewhere in the report, the presence of flooding does not identify mechanism; it establishes the intermittent water-loaded state against which later dry-season conditions must be judged.

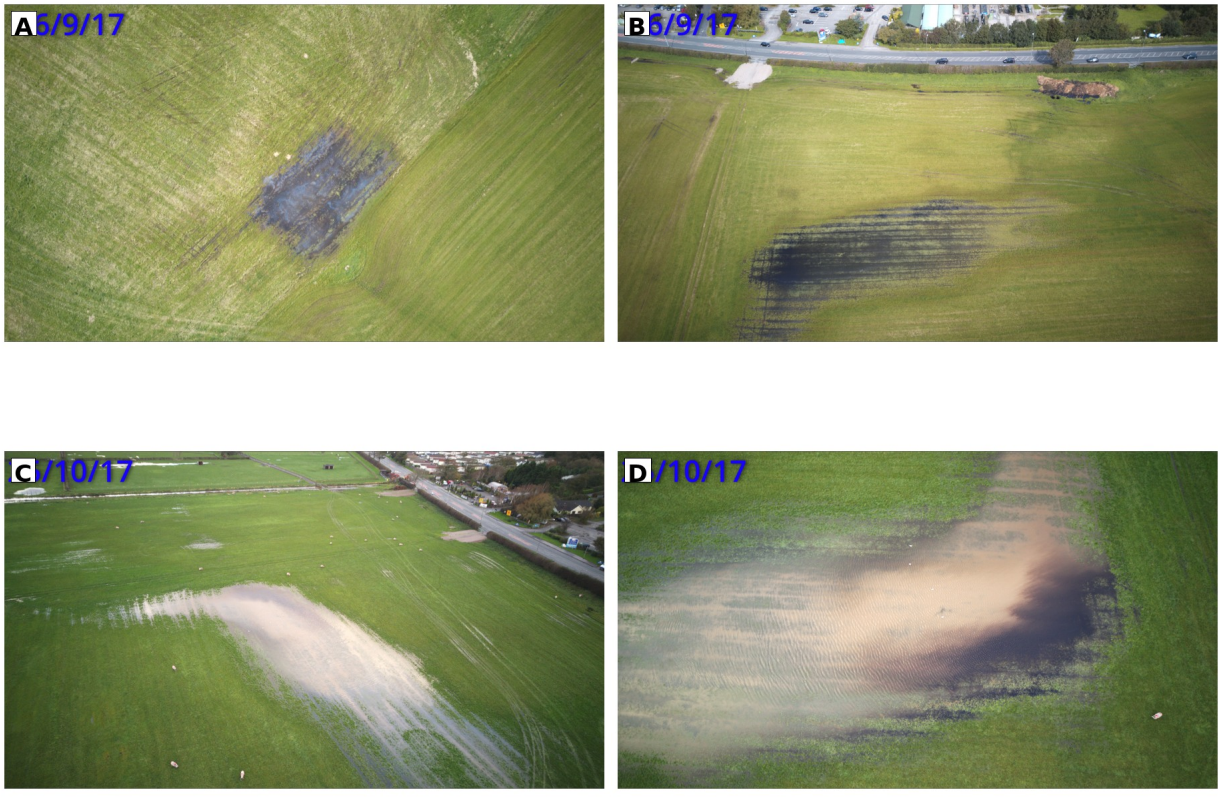


Figure 50. *Field immediately south of the Preston New Road/Moss House Lane junction: 2017 temporal sequence. (A) 16 September 2017 close view of the dark stained or tonally differentiated expression. (B) Wider 16 September 2017 view showing a nearby feature within the field context. (C) 25 October 2017 wider flood-state view. (D) Closer 25 October 2017 view showing pale-brown open water and darker marginal response. The sequence establishes changing surface condition rather than a measured rate of ground change.*

July 2026 dry-state condition and LiDAR context

The 9 July 2026 views show the field returned to a dry-season condition, but not to a visually uniform state. Broad pale or thinned vegetation remains visible across the same wider field, and the response extends beyond a single narrow tramline or isolated point. The supplied 2018–2022 LiDAR-difference view places the field within a broader area of

non-uniform relative elevation change. That spatial layer is independent of the aerial photographs and therefore useful as comparison context, while remaining subject to the usual limits of LiDAR differencing.

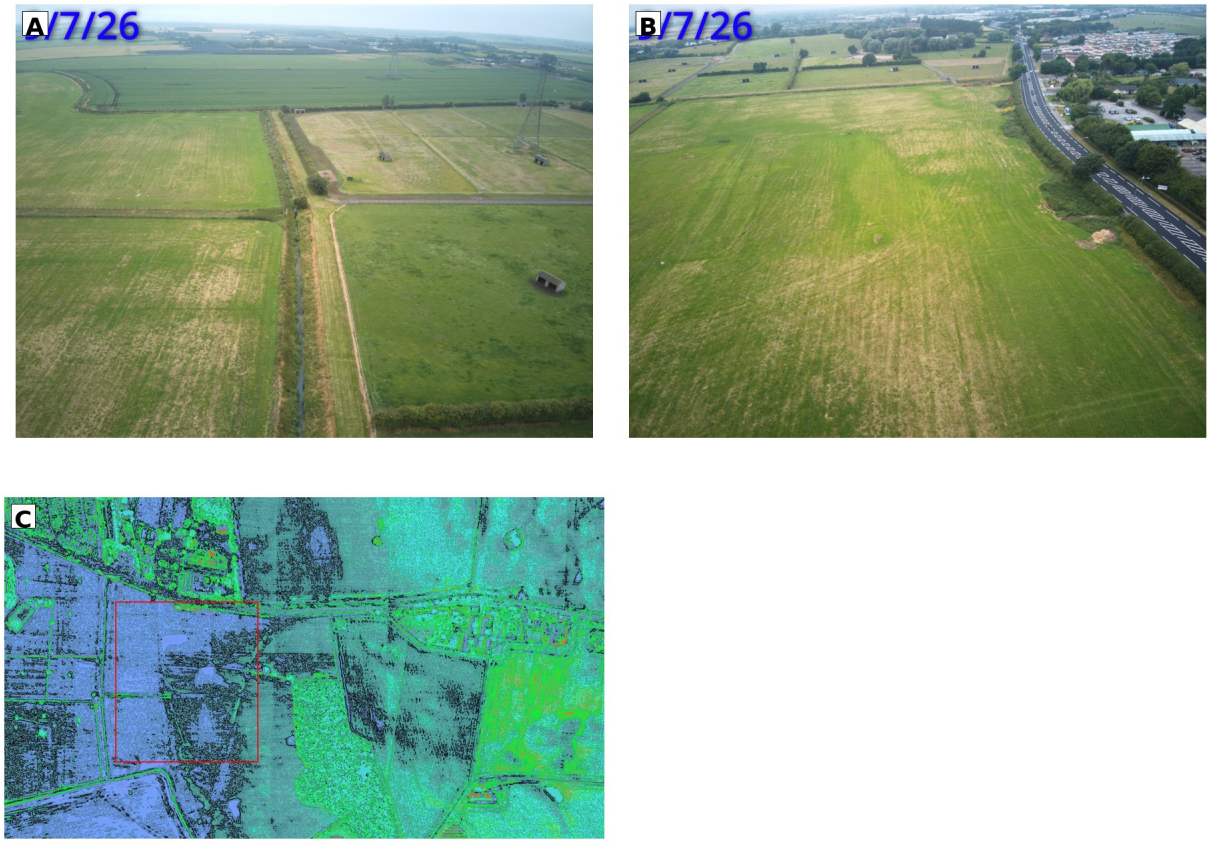


Figure 51. *Field immediately south of the Preston New Road/Moss House Lane junction: later dry-state condition and LiDAR context. (A-B) 9 July 2026 wide oblique views showing broad pale or thinned vegetation across the same wider field setting. (C) 2018–2022 LiDAR-difference view placing the location within the broader non-uniform elevation-change pattern.*

Local synthesis

Taken together, this field sequence records a progression from a marked 2017 dark-stained or tonally differentiated expression, through October 2017 inundation with pale-brown water and darker margins, to a 2026 dry-state field still showing broad pale or thinned vegetation in the same wider location. The sequence is therefore relevant not because any one frame is diagnostic, but because the same field presents contrasting fluid, sediment-like and vegetation-stress states over time.

10. PHF-BAL-007 — Intervening field between Ground Adjustment Locations 2 and 3

Flood-state context and later dry-state response

This location lies between Locations 2 and 3 in the Ground Adjustment report and serves as the closing link within that local southeastward set. On 25 October 2017 the field corner and adjoining drainage line contain extensive standing water. The wider view records broad inundation, while the closer view shows turbid pale-brown water curving around the drainage corner and field edge. The imagery is therefore consistent with a convergent, low-relief water-collecting sector within the wider field system.

In July 2026, a time of drought, a broad pale or reduced-growth field expression remains visible within the same corner setting where fields are at the lowest and water is more readily available. The supplied LiDAR-difference view places the area inside a wider zone of non-uniform change. As in the preceding sections, the imagery does not prove that the dry-state pattern is caused by the same process that produced the flood-state pattern. Its importance lies in showing that the intervening field is not visually neutral: it participates in the same broader sequence of water loading, later pale response and independent elevation context.

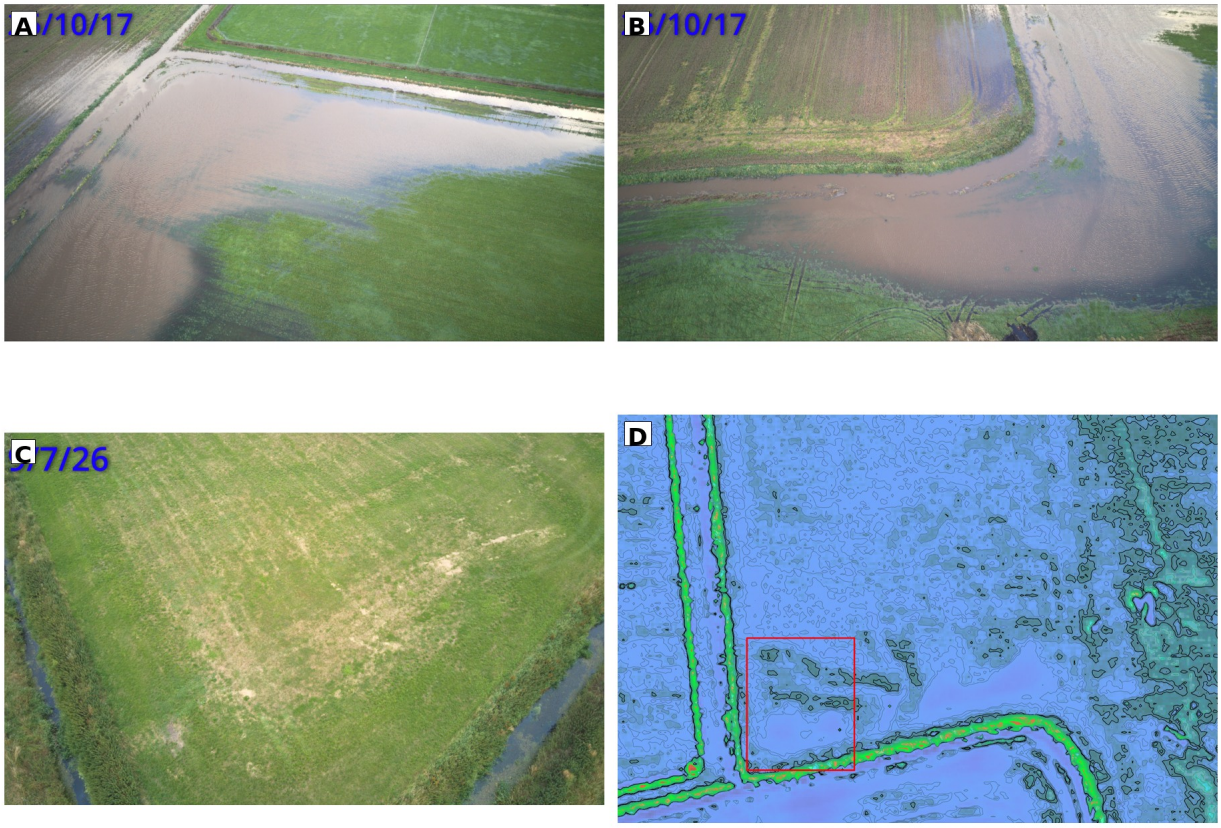


Figure 52. *Intervening field between Locations 2 and 3. (A) 25 October 2017 wider flood-state view. (B) Closer 25 October 2017 view of the drainage-corner inundation. (C) 9 July 2026 dry-state view showing the broad pale or reduced-growth field expression. (D) 2018–2022 LiDAR-difference context for the same wider area. The sequence closes the spatial gap between the previously reported locations.*

Local synthesis

This intervening field strengthens continuity across the local landscape. It shows that the area between Locations 2 and 3 in *Evidence of Progressive Ground Adjustment* also moved between a pronounced water-loaded state and a later

dry-state field with broad pale differentiation. Even without assigning cause, that continuity supports treating the reported locations as parts of a wider pattern rather than as isolated individual incidents.

11. PHF-BAL-008 — Fields east of Peel Road

Spatial and topographic context

The final group of fields lies farther southeast again, immediately east of Peel Road. The satellite overview identifies the area examined and places it within the wider agricultural landscape extending southeast from the previously documented locations. The 2018–2022 LiDAR-difference view provides the corresponding terrain-change context.

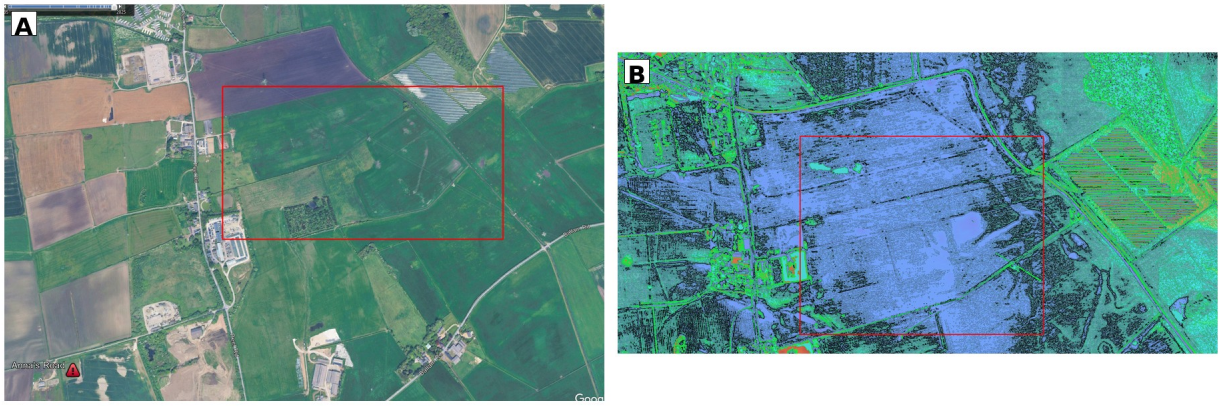


Figure 53. *Fields east of Peel Road: spatial context. (A) Satellite overview locating the final field group east of Peel Road. (B) 2018–2022 LiDAR-difference view placing the same field group within the wider non-uniform elevation-change setting. Display colours and contours are comparison aids rather than mechanism indicators.*

Wide-field July 2026 condition

Wide aerial imagery acquired on 9 July 2026 records extensive, spatially uneven pale and sparse vegetation across several adjoining field compartments. The response is not confined to cultivation lines or a single isolated patch. Broad mottled zones cross substantial parts of the fields, while greener strips and blocks remain alongside them, producing marked differences within the same managed area.

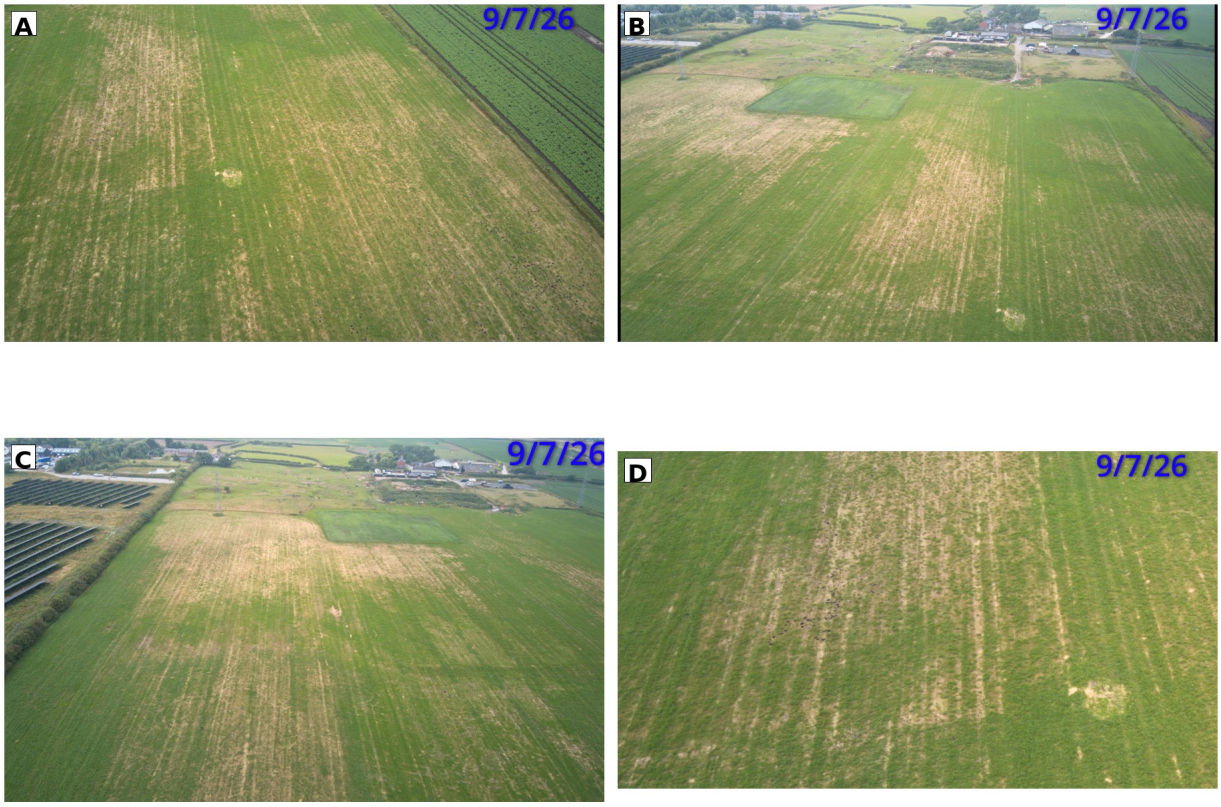


Figure 54. *Fields east of Peel Road: wide 9 July 2026 condition. (A-D) Wide and oblique views showing extensive pale or thinned vegetation, mottled sectors and differentiated field compartments across the final southeastward field group. The wide views establish field-scale spread but do not resolve the morphology of individual points.*

Close manifestations within the wider pale response

Closer views show that the broad tonal response contains multiple discrete surface features. These include a pale patch accompanied by small greener or point-like tufts, clustered dark circular or irregular points, isolated pale exposed patches and isolated darker openings. Some dark features occur in dense groups, while others are more isolated. The close views are therefore important because what appears from distance as generalised poor growth resolves into a heterogeneous surface containing numerous discrete manifestations.

The observations do not, by themselves, establish the origin of the individual features. However, their repetition, clustering and coexistence with broad vegetation disturbance are consistent with manifestation classes documented at the preceding locations. Their occurrence this far southeast extends the observed spatial distribution and supports treating the fields as part of the wider landscape pattern rather than as an isolated agricultural response.

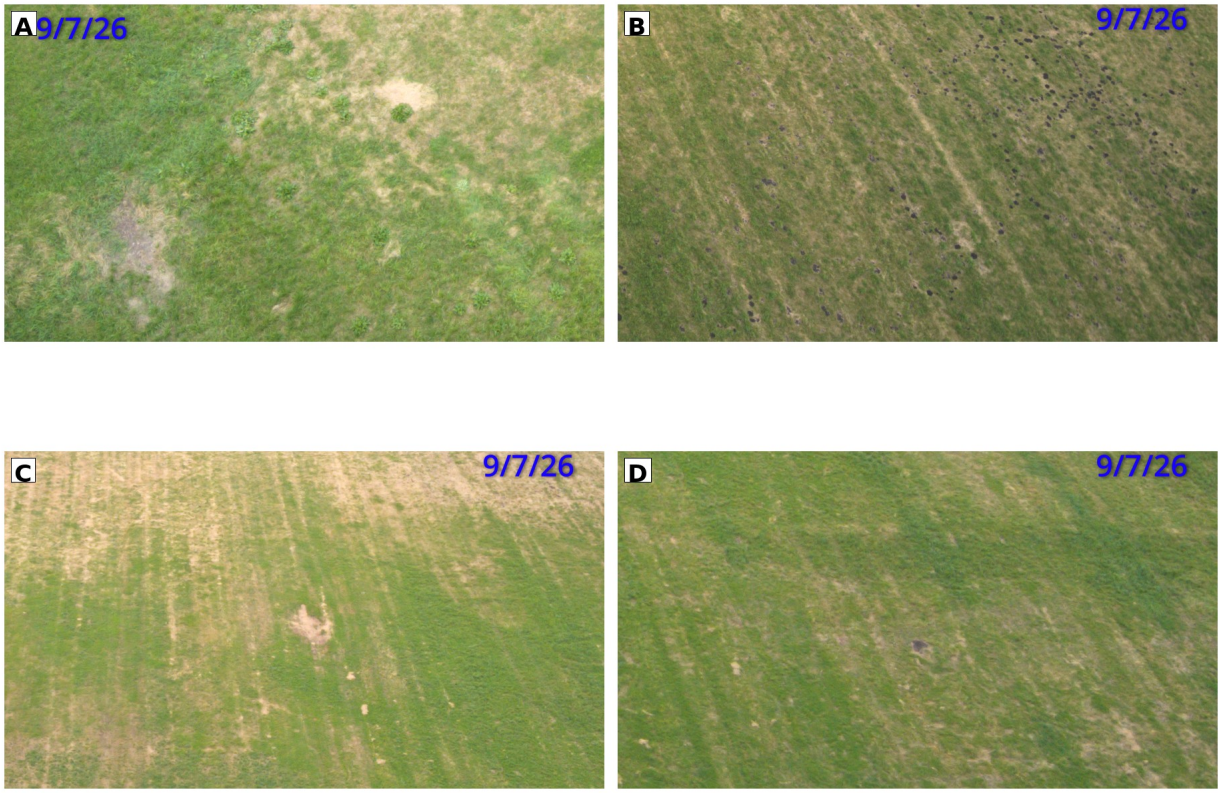


Figure 55. *Fields east of Peel Road: close manifestations. (A) Pale patch with several small greener or point-like tufts. (B) Clustered dark circular or irregular points within stressed vegetation. (C) Isolated pale exposed patch within the wider pale field response. (D) Isolated darker opening or exposed point. The close views demonstrate that the broad field-scale response resolves into multiple discrete manifestation classes.*

Local synthesis

This final field group is significant because it does more than repeat a single earlier observation. It demonstrates that the broader landscape response continues farther southeast, and that apparently generalised vegetation stress can conceal dense clusters of discrete pale, dark and exposed-surface manifestations when viewed at closer range. Read together with the LiDAR comparison, the sequence provides a further reason for targeted ground inspection and repeat elevation survey.

12. Cross-location synthesis

Across the southward and southeastward location sequences, the archive now records a repeat progression: comparatively uniform or ordinarily managed agricultural ground; local or field-scale water loading; red-brown, pale or mottled vegetation and soil response; recession of open water; later discrete point manifestations, stressed lines, splodge-type forms or exposed patches; and independent LiDAR or satellite differentiation. The order and expression vary by field, which is expected in a low-relief, drainage-dependent landscape with different crops, soils and field management.

The strongest evidential point is therefore not one dramatic morphology. It is the recurrence of multiple manifestation classes at adjacent and near-adjacent locations, their relationship to earlier water-sensitive sectors, and their persistence or re-expression under contrasting wet and dry conditions. That pattern now extends from the earlier Gardeners Lower Fields and Location 11 areas into the fields south of the Preston New Road/Moss House Lane junction, the intervening field between Locations 2 and 3, and the final fields east of Peel Road. It does not make a single shared mechanism certain, but it makes a purely incident-by-incident assessment inadequate.

These features also extend northwards, following the same manifestation classes. Outside the area of lowering, fields present with a normal response. Analysis of these locations are beyond the scope of this document.

The Location 11 and Hex pond sequence adds a particularly important combination: pond containment loss or overtopping, redistribution of water outside the enclosed pond, pale deposited or exposed material, an apparent channel-like outlet, a field-scale depression and later discrete emergences. The additional southeast sequences broaden that picture. They include a junction-adjacent field that moved from dark staining to flooding and later pale stress, an intervening field that links the previously reported locations through a similar wet-to-dry progression, and a Peel Road field group where the wider pale response resolves into numerous discrete manifestations at close range.

12.1 Hydrological loading and dry-state re-expression

The integrated chronology shows that open water is only one phase of the evidential cycle. Several locations move from inundation or saturation into residual field differentiation and later re-expression under apparently recovered, harvested or dry conditions. This prevents the absence of water on a later visit from being treated as evidence that the underlying water-sensitive or ground-sensitive sector has ceased to be relevant.

12.2 Spatial continuity without assumed uniformity

The manifestation classes do not repeat identically at every location. The bowl presents as concentrated ponding and an elongated wet footprint; Gardeners Lower Fields combine drainage loading, residual mottling, cream material and bank response; Location 11 adds pond overtopping, an apparent outlet and discrete emergences; the southeast fields show broad vegetation stress resolving into clustered point manifestations. This heterogeneity is compatible with differences in relief, soil, crop, drainage and land use and does not require one visible form to recur everywhere.

12.3 Independent comparison layers

LiDAR and satellite comparisons strengthen the spatial case where they identify differentiated sectors independently of the close aerial observations. They do not identify cause. The PNR-1z fracture and induced-event map adds operational and seismic plan-view context to PHF-BAL-005, but positional uncertainty and lack of depth information prevent one-to-one attribution of any surface feature.

13. Limitations and alternative explanations

- Rainfall, overland flow, low natural relief, blocked or undersized drains and ordinary flood recession can account for substantial parts of the wet sequence.
- Crop type, sowing, cutting, fertiliser or treatment, grazing, poaching, wheelings, compaction and failed establishment can create lines, mottling, bare points and sharp field contrasts.
- Colour is affected by illumination, haze, camera profile, DNG conversion, video extraction and later grading. Red, cream, white or dark tone does not identify chemistry.
- Aerial perspective does not reliably distinguish a mound, depression and flat exposed patch at every point. Morphology classes are working field-triage labels, not laboratory determinations.
- LiDAR differencing can contain vegetation, water-surface, alignment and interpolation effects. It is an independent spatial layer, not a mechanism detector.
- The fracture and seismic map is a plan-view summary with uncertainty envelopes. It cannot establish a direct vertical pathway to a surface feature.

These alternatives should be tested rather than used as reasons to discard the spatial-temporal pattern. A satisfactory explanation must account for location, recurrence, hydrological state, crop response, field-boundary behaviour and independent elevation context together.

The alternatives are not mutually exclusive. Ordinary flooding and drainage limitation may account for open-water phases while crop management, compaction or animal disturbance contribute to later surface form. The scientific requirement is therefore not to select one visual explanation in advance, but to test whether the full location, recurrence, hydrological state, crop response, bank behaviour and elevation context can be explained together.

14. Proportionate investigation

The next investigation stage should remain targeted and reproducible. The first southward field still requires repeat topographic profiling of the observer-identified raised form and the stressed-vegetation line, together with drainage mapping and comparison of the 2017, 2018, 2021 and 2026 footprints. The junction-adjacent field south of the Preston New Road/Moss House Lane junction should be tested by comparing the 2017 stained and flood-state footprint with the 2026 pale or thinned vegetation footprint. The intervening field between Locations 2 and 3 should be inspected as the local link between those previously reported sectors, with repeat survey of the flood-prone corner and the later pale field expression. East of Peel Road, the broad pale sectors and the discrete close-range manifestations should be checked by transect-based ground inspection and repeat elevation survey.

At Location 11, the Hex pond, overtopping route, pale deposit, apparent outlet, DJI_0275 field expression and LiDAR depression should be surveyed as one local system. Fixed ground-control points, repeat UAV orthomosaics and a simple digital elevation model would test whether the visible alignments correspond to measurable relief. Pond and field-water levels should be recorded simultaneously after rainfall and during recession. The same approach should be extended to the added southeast fields so that wet-state and dry-state geometries can be compared directly rather than inferred from imagery alone.

Where water, wet sediment, pale material, red-brown staining or point-source emergence recurs, paired affected and comparison samples should be collected with documented position and chain of custody. A proportionate initial suite would include pH, electrical conductivity, turbidity, radionuclide presence, alkalinity, major ions, dissolved metals and a visual or microscopic sediment description. Agricultural inputs and drain-maintenance records should be reviewed alongside the sampling results.

The shallow survey should then be compared with the PNR-1z lateral, fracture-stage mapping, induced-event uncertainty envelopes and any separately documented plumb-line observations. Those layers should remain analytically distinct until a specialist can assess their positional accuracy and relevance.

14.1 Corridor-wide minimum design

- establish fixed ground-control points and repeat RTK-GNSS, total-station or controlled UAV topographic surveys across the principal PHF-BAL locations;
- map field drains, ditches, culverts, channel banks, known drainage works and land-management changes;
- record shallow groundwater, pond and field-water levels simultaneously after rainfall and through recession;
- collect paired affected and control water, pore-water, wet sediment, pale material and soil samples with documented position and chain of custody;
- include pH, electrical conductivity, turbidity, alkalinity, major ions, dissolved metals and sediment description in the initial analytical suite;
- repeat inspection under sustained wet and dry conditions; and
- compare shallow results with LiDAR, the PNR-1z operational corridor, induced-event uncertainty envelopes and any separate plumb-line evidence without conflating those datasets.

15. Conclusions

1. The first southward field displays a coherent chronology of 2017 water and colour response, 2018 mottling, an independent 2021 crop pattern and a 2026 stressed line with point-like disturbance within a LiDAR-differentiated setting.
2. The intermediate field records October 2017 hydrological loading, later mottled vegetation and December 2025 discrete surface disturbance in the same wider drainage-boundary setting.
3. Location 11 combines pond overtopping, redistribution of water, a pale deposited or exposed area, an apparent channel-like outlet, field-scale depressions, later discrete emergences and non-uniform LiDAR change.
4. The July 2026 imagery broadens the manifestation set across adjoining fields and includes pale or cream splodge-type forms, discrete emergences, red-brown staining, crop stress and dark exposed points within the mapped PNR-1z operational corridor.
5. The field immediately south of the Preston New Road/Moss House Lane junction records a marked 2017 stained expression, later flood-state water and sediment-like response, and a 2026 dry-state field still showing broad pale or thinned vegetation.
6. The intervening field between Locations 2 and 3 links those reported areas by showing a comparable progression from documented flooding to later pale field differentiation within the same wider corner setting.
7. The final fields east of Peel Road extend the observed distribution farther southeast and show that wide pale or sparse vegetation can resolve, at closer range, into clustered dark points, isolated pale exposed patches and other discrete manifestations.
8. The combined sequence establishes a coherent, recurrent and spatially expanding evidential pattern that warrants integrated inspection, survey and targeted sampling.
9. PHF-BAL-001 and PHF-BAL-002 add the early corridor context: organised bowl ponding, a field adjoining Location 4 that progresses through colour, wetness, flooding, apparent recovery and later dry-state differentiation, and a broader Gardeners Lower Fields record that repeatedly links drainage loading, residual response and bank-adjacent manifestations.
10. The integrated report establishes the evidential threshold for landscape-scale inspection, repeat measurement and targeted sampling before irreversible ground disturbance or loss of access reduces the opportunity to test the observations.
11. The documented features recur and evolve across multiple local corridors, low-lying sectors and drainage-connected landscape units. Taken together, they form a distributed landscape pattern with potential catchment-scale significance and warrant investigation at catchment scale rather than continued treatment as isolated events. The material presented here represents only a small fraction of the available archive.

References and internal source documents

Nye, D. (2026). Evidence of Progressive Ground Adjustment and Subsurface Flow Reorganisation around Preston New Road.

Nye, D. (2026). LiDAR Comparisons 2018 to 2022 of the Fylde Coast.

Nye, D. (2026). PNR Pre-Deconstruction Hydro-Mechanical Surface Behaviour.

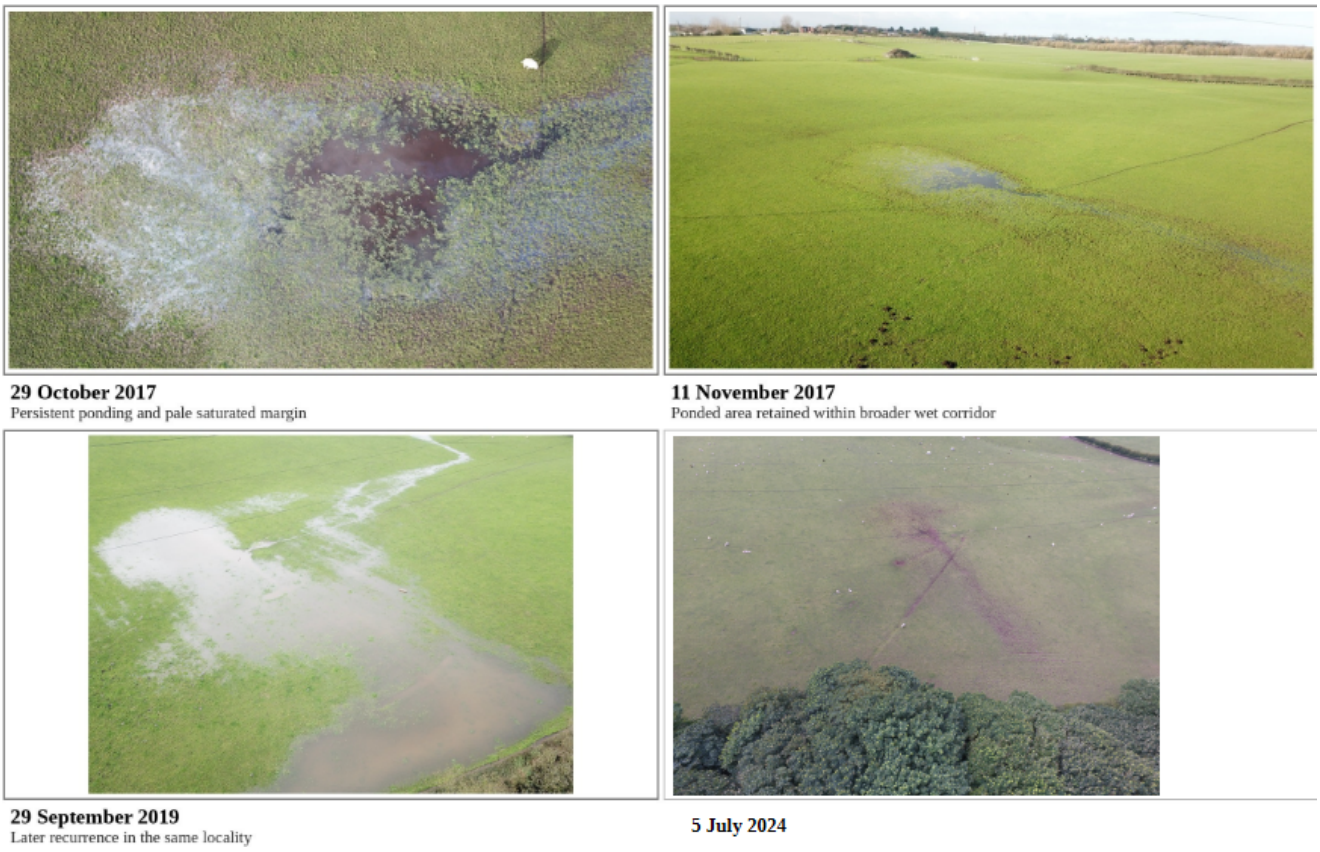
Nye, D. (2026). Temporal Development of Field Depressions and Pond-Associated Surface Change beside Preston New Road.

DEFRA LiDAR surface datasets used for the 2018 and 2022 epoch comparison. Processing details remain tied to the retained QGIS project.

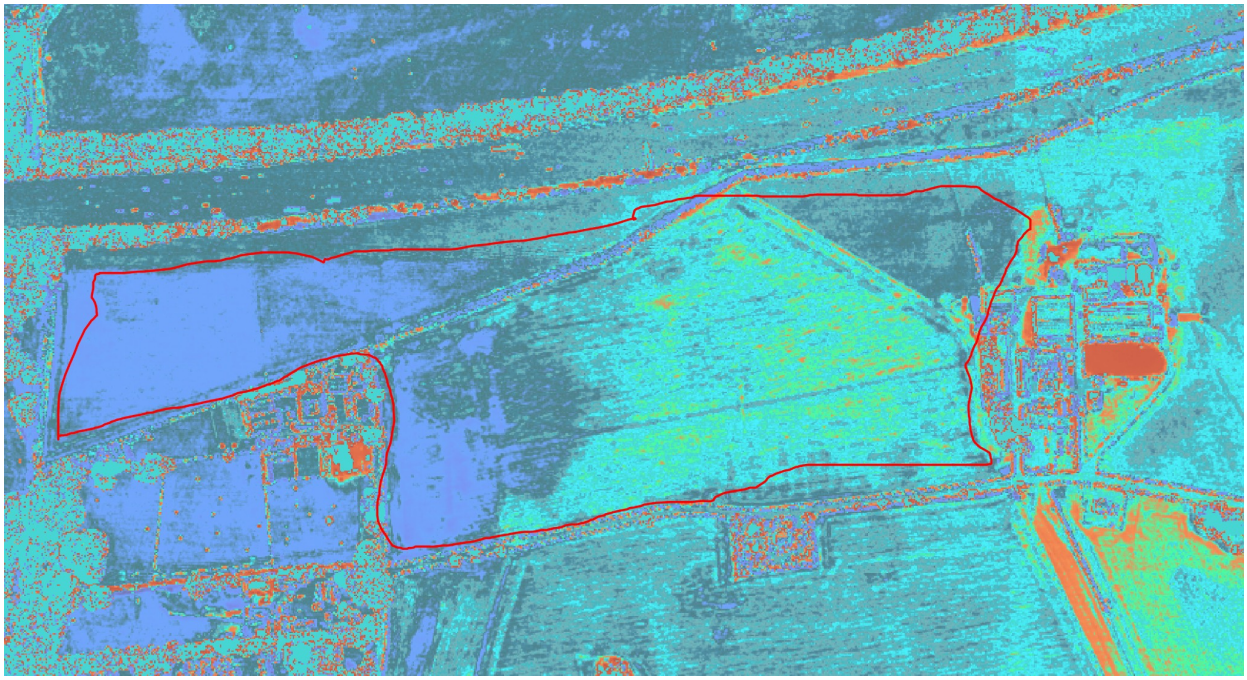
Recovered archive from davidsmythe.org - PNR-1z fracture-stage and induced-seismicity plan-view summary used for spatial context in Figure 49 of this integrated report.

Appendix A. Supporting image plates

The following plates retain supporting, alternative or superseded views that were not required within the principal integrated sequence. They preserve provenance, alternative viewing angles and drafting history without interrupting the main evidential flow.



Appendix Plate A1. *Additional bowl chronology from 29 October 2017, 11 November 2017 and 29 September 2019. The sequence preserves further examples of ponding or wet-ground recurrence within the same broad PHF-BAL-001 .locality*



Appendix Plate A2. *Broad LiDAR/landscape outline used to define the initial Gardeners Lower Fields working extent.*

Appendix Plate A3. *14 September 2018 context image showing the Location 4 sector, the field above it and adjoining parts of the earlier field-edge sequence.*

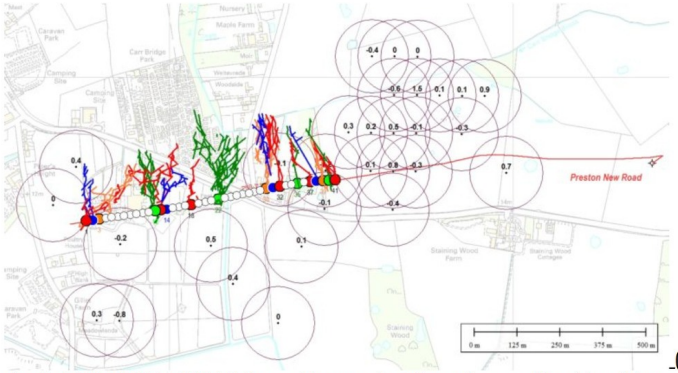
Appendix Plate A4. *Unedited 14 September 2018 Location 4 view corresponding to the annotated close comparison used in the main figure sequence.*

Appendix Plate A5. *Alternative 15 October 2019 recession views providing wider and intermediate-angle context for residual wet ground and the drainage margin.*

Appendix Plate A6. *Supporting 15 October 2019 views of the differentiated western-field vegetation block and cream-coloured fibrous or matted material.*

Appendix Plate A7. *Supporting July 2024 views, including alternative field-scale and close surface-pattern comparisons.*

C



(https://web.archive.org/web/20230201125219/http://www.davidsmythe.org/frackland/wp-content/uploads/2019/03/PNR-1z-frack-summary-with-quake-circles.jpg)

Fracks (multicoloured lines) on PNR-1z. Induced earthquake locations shown by dots annotated with local magnitude; circles indicate approximate location error. Click to enlarge.

Appendix Plate A8. *Additional 12 October 2017 drainage-side view; superseded unbalanced 16 September 2017 render retained to document the grading change; and supplied source screenshot for the archived PNR-1z fracture and induced-seismicity map.*

Appendix B. Integrated working image register

The following source registers are retained substantially as drafted. Figure references have been adjusted to the integrated numbering where possible. Original UAV filenames and exact Google Earth acquisition dates should replace temporary screenshot identifiers during archive reconciliation. All images are available from the author.

B1. Initial corridor and bowl register

Ref.	Date	Source file	Use / observation
A1	15/11/2017	Filename to add	Wider-field surface differentiation; contextual frame
A2	16/07/2026	Filename to add	Bare junction and converging surface lines; contextual frame
A3	03/10/2017	DJI_0276(2).JPG	Early concentrated ponding in adjacent bowl
A4	14/10/2017	DJI_0207 (2).JPG	Wider field-scale bowl expression
A5	22/10/2017	DJI_0181.JPG	Open-water core and saturated vegetation
A6	22/10/2017	DJI_0182(1).JPG	Alternative close/vertical bowl view
A7	22/10/2017	DJI_0177.JPG	Oblique elongated wet footprint
A8	2018–2022	image(163).png	Wider LiDAR-difference context
A9	2018–2022	image(165).png	Bowl locator within LiDAR display
A10	29/10/2017	DJI_0146.JPG	Additional persistent ponding
A11	11/11/2017	DJI_0088.JPG	Later bowl and wet-corridor condition
A12	29/09/2019	DJI_0221.JPG	Later recurrence in the same locality

Field	Required content
Location identifier	PHF-BAL-00X
Early / baseline state	One wide frame and, where useful, one close frame
Wet or active state	One frame showing ponding, seepage, staining or local disturbance
Recent state	One frame showing exposed sediment, reduced growth, depression or altered morphology
LiDAR context	One locator or contour panel where it materially assists interpretation
Interpretive text	Observation; persistence; alternatives; limits; proportionate field check
Appendix entry	Dates, filenames, source type and any processing note

B2. Field adjoining Location 4 register

Ref.	Date	Source file	Source/type	Location or feature	Observation and purpose
A13	12/10/2017	[filename to add]	UAV still or video-derived still	Field and channel margin	Red to red-brown vegetation in both adjoining fields and within the watercourse; localised dark and paler brown-red fluid or saturated ground around cattle. Early combined water, vegetation and colour expression.
A14	16/10/2017	[filename to add]	UAV wide oblique still	Channel-side field margin	Local wetness; scattered irregular dark or exposed surface features; broad curved strip without established crop or with reduced vegetation. Landscape context and pre-inundation ground condition.
A15	25/10/2017	[filename to add]	UAV still	Lower field	Extensive brown to red-brown standing water across a substantial part of the cropped field and adjoining margins. Peak visible hydrological expression.
A16	14/08/2018	[filename to add]	UAV oblique still; annotated working copy	Field and opposite Location 4 bank	Main field again vegetated; broad bare or reduced-growth channel-side strip; irregular field features and scarp-like bank forms. Later condition and spatial relationship to Location 4.

Ref.	Date	Source file	Source/type	Location or feature	Observation and purpose
A17	16/07/2026	[filename to add]	UAV JPEG; wide oblique; annotated working copy	Harvested field	Broad pale to reddish differentiated sector and numerous discrete surface features visible against regular harvest lines. Recent dry-condition field-scale context.
A18	16/07/2026	[DNG filename to add]	UAV DNG-derived still; annotated working copy	Highlighted field sector	Pronounced red to red-brown tonal response with multiple small dark, pale or exposed surface features. Detail and DNG/JPEG comparison; not chemical identification.
A19	2018–2022	[LiDAR screenshot filename to add]	EA LiDAR difference display / QGIS screenshot	PHF-BAL-002 and Location 4 corridor	Wider relative elevation-change context; local values not yet extracted. Independent spatial comparison layer.
A20	[date to add]	[filename to add]	Later UAV or ground image	Channel-side tree line	Later deterioration, death or loss of trees within the corridor, if clearly demonstrated by the selected comparison. Supporting chronology; retain outside the main sequence until dated and verified.

B3. Gardeners Lower Fields Part 1 register

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
B1-01	05/10/2017	Screenshot_7(1).png	UAV screenshot	GLF broad context	Comparatively uniform vegetated fields with local standing water in the wider landscape. | Early landscape baseline.
B1-02	14/10/2017	Screenshot_8(1).png	UAV screenshot	M55/GLF context	Regional saturation and extensive water across the motorway; target field mostly continuous. | Hydrological control and cross-M55 context.
B1-03	14/10/2017	Screenshot_9(1).png	UAV screenshot	Central field	Long narrow dark line with local bifurcation and reflective points. | Record early surface geometry; interpretation unresolved.
B1-04	14/10/2017	Screenshot_10(1).png	UAV screenshot	Suspected drainage sector	Discontinuous linear/curving shallow water and saturated ground through otherwise vegetated field. | Principal early drainage-sensitive expression.
B1-05	16/10/2017	Screenshot_11.png	UAV screenshot	Channel/power pole	Visible channel and locally differentiated field-edge ground near the pole. | Drainage-detail reference.
B1-06	16/10/2017	Screenshot_12.png	UAV screenshot	Channel to M55	Long channel relationship with field, pole and motorway. | Spatial locator.
B1-07	2018–2022	image(172).png	QGIS screenshot	Local LiDAR sector	Highlighted sector lies within negative relative-change classes. | Independent spatial comparison.
B1-08	2018–2022	image(173).png	QGIS symbology key	LiDAR legend	Negative to positive relative-elevation-change classes. | Interpretation key for LiDAR figures.
B2-01	23/11/2017	Screenshot_13.png	UAV screenshot	Main Drain-side field	Large pale-brown field-scale inundation and boundary water. | Principal flood-extent record.
B2-02	23/11/2017	Screenshot_14.png	UAV screenshot	Southern landscape	Sheet ponding, boundary accumulation and

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
					branching wet corridors across fields. | Landscape hydrological context.
B2-03	23/11/2017	Screenshot_15.png	UAV screenshot	Field east of drain	Broad irregular standing-water area within otherwise green field. | Precursor location for later change.
B2-04	25/11/2017	Screenshot_16.png	UAV screenshot	Location 4/Main Drain	Brown channel water and standing water immediately opposite on GLF side. | Location 4 integration.
B2-05	13/01/2018	Screenshot_17.png	UAV screenshot	Main Drain and adjacent fields	Persistent saturation; variable channel reflections; dark adjacent-field patches. | Persistence and cross-location relationship.
B2-06	13/01/2018	Screenshot_18.png	UAV screenshot	M55 field margin	Cluster of circular/sub-circular brown ground forms. | Early mound/circular-form group.
B2-07	2025	image(174).png	Google Earth screenshot	M55/GLF locator	Later landscape image with pin at approximate 2018 form group. | Spatial reference only.
B2-08	13/01/2018	image(175).png	Cropped UAV image	Circular-form group	Discrete rounded brown forms of variable size. | Morphology detail; relief unresolved.
B3-01	14/01/2018	Screenshot_19.png	UAV screenshot	Former inundation margin	Elongated red-brown expression after floodwater recedes. | Post-flood colour response.
B3-02	10/03/2018	Screenshot_20.png	UAV screenshot	Main field	Broad red/yellow-brown field-scale hue with darker local patch. | Temporal continuation of field response.
B3-03	22/03/2018	Screenshot_21.png	UAV screenshot	Location 4-side field	Mottling, residual standing water and red-brown differentiation. | Bridge between flooding and later condition.
B3-04	09/08/2018	Screenshot_22.png	UAV screenshot	Middle field	Broad pale/mottled zones with irregular curving boundaries. | Dry/recovered-condition manifestation.
B3-05	14/09/2018	Screenshot_23.png	UAV screenshot	Location 4 corridor	Scarp setting, fallen trees, bright vegetation and wet ground. | Spatial relationship figure.
B3-06	05/10/2018	Screenshot_24.png	UAV screenshot	Recovered fields	Broadly green cover with persistent diffuse pale/mottled areas. | Apparent recovery without full uniformity.
B3-07	05/10/2018	Screenshot_25.png	UAV screenshot	Power pole/channel strip	Irregular pale/brown strip with darker points beside drain. | Principal drainage-margin disturbance.
B3-08	05/10/2018	Screenshot_26.png	UAV screenshot	Adjoining fields/drain	Agricultural parallel lines contrasted with irregular pasture manifestations. | Alternative-control comparison.
B3-09	05/10/2018	Screenshot_27.png	Oblique UAV screenshot	Drainage margin	Pale mottling and small mound-like/exposed forms near channel. | Oblique morphology context.
B3-10	22/09/2019	Screenshot_28.png	UAV screenshot	Location 4 bank	Discrete dark sub-circular disturbed area near channel; tree material nearby. | Later persistence.
B3-11	2018–2022	image(176).png	QGIS screenshot	Wider GLF LiDAR	Spatially variable negative, near-zero and

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
					positive relative-change classes. | Wider independent comparison.
B3-C1	05/10/2018	image(177).png	Cropped UAV image	Power-pole field	Low-contrast mottling and irregular field strip near pole. | Detail of Screenshot_25 sector.
B3-C2	05/10/2018	image(178).png	Cropped oblique UAV image	Drainage margin	Flattened/oriented vegetation with small exposed or dead-looking forms. | Clarify uncertain mound/dead-vegetation morphology.
B3-C3	05/10/2018	image(179).png	Cropped UAV image	Opposite side of drain	Comparable irregular vegetation/ground manifestations across channel. | Cross-channel comparison.
B3-C4	14/09/2018	image(181).png	Annotated UAV crop	Location 4	Boxes identify scarp-like forms, bright vegetation, wet tree bases and reflective water. | Annotated interpretation aid.
B3-C5	14/09/2018	image(182).png	Unedited UAV image	Location 4	Unedited source for annotated Location 4 close view. | Source/provenance and unobstructed comparison.
CTX-01	[context]	image(170).png	Annotated LiDAR image	GLF working extent	Outlined broad study area across multiple fields, drain and developed land. | Define working spatial unit.
CTX-02	14/09/2018	image(171).png	Annotated UAV image	Location 4/adjacent fields	Context image linking scarp, later-hole sector and adjoining field edge. | Interconnected-location scratchpad reference.

B4. Gardeners Lower Fields Part 2 register

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
P2-01	22/09/2019	Screenshot_31.png	UAV screenshot	Western field beside Location 4	Broad sharply differentiated taller/paler vegetation block with discrete darker forms. | Main pre-flood western-field condition.
P2-02	22/09/2019	Screenshot_32.png	UAV screenshot	Drainage-side field	Dark lines, discontinuous marks and broad mottling within a less uniform field sector. | Main pre-flood drainage-side condition.
P2-03	22/09/2019	Screenshot_33.png	UAV screenshot	Tributary margins	Dark points and irregular expressions visible on both sides of the tributary. | Main cross-channel spatial comparison.
P2-04	11/10/2019	Screenshot_29.png	UAV screenshot	Middle cultivated field	Extensive pale-brown standing water across the field and agricultural lines. | Principal flood-extent figure.
P2-05	15/10/2019	Screenshot_30.png	UAV screenshot	Middle cultivated field	Most open water receded; residual wetness, pale-brown surface and discrete forms remain. | Principal recession figure.
P2-06	15/10/2019	Screenshot_36.png	UAV screenshot	Drainage-side field margin	Closer oblique view of residual wet ground and dense dark-form belt. | Recession morphology detail.
P2-07	15/10/2019	Screenshot_39.png	Cropped UAV image	Post-flood field forms	Discrete circular to irregular dark forms within pale-brown field surface. | Main close morphology panel.
P2-08	15/10/2019	Screenshot_40.png	Cropped UAV image	Post-flood field forms	Broader density and

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
					distribution of dark forms near the drain. | Supporting main close panel.
P2-09	15/10/2019	Screenshot_34.png	UAV screenshot	Location 4/western field	Standing water, irregular channel margin, fallen tree material and cream patches. | Main Location 4 integration figure.
P2-10	15/10/2019	Screenshot_41.png	Cropped UAV image	Cream-coloured material	Fibrous or matted pale material interspersed with green vegetation. | Material morphology detail.
P2-11	15/10/2019	Screenshot_43.png	UAV screenshot	Western grassed field	Multiple discontinuous cream-coloured patches distributed across the field. | Main field-scale distribution figure.
P2-12	15/10/2019	Screenshot_44.png	Cropped UAV image	Cream-coloured material	Closer view of irregular pale fibrous or matted patches. | Detail paired with P2-11.
P2-A1	15/10/2019	Screenshot_35.png	UAV screenshot	Middle and western fields	Alternative wide recession and field relationship view. | Appendix C1.
P2-A2	15/10/2019	Screenshot_37.png	UAV screenshot	Middle cultivated field	Intermediate oblique recession view with residual wet sectors. | Appendix C1.
P2-A3	15/10/2019	Screenshot_38.png	UAV screenshot	Western vegetation block	Closer field-scale view of the sharply differentiated vegetation area. | Appendix C2.
P2-A4	15/10/2019	Screenshot_42.png	Cropped UAV image	Cream-coloured material	Additional close view of fibrous or matted patches. | Appendix C2.
P2-13	05/07/2024	Screenshot_46.png	UAV screenshot	Western field and farm margin	Field-scale context for localised dark and pale disturbance. | Main July 2024 locator.
P2-14	05/07/2024	Screenshot_47.png	UAV screenshot	Adjoining green field	Elongated and branching darker or flattened crop expressions. | Main summer field-response figure.
P2-15	05/07/2024	Screenshot_57.png	Cropped UAV image	Western-field disturbed sector	Dark linear tears or reduced-cover expressions within a concentrated patch. | Main July detail.
P2-16	05/07/2024	Screenshot_61.png	Cropped UAV image	Green-field disturbance	Elongated darker field response with curved crop deformation and pale patches. | Main July detail.
P2-A5	05/07/2024	Screenshot_45.png	UAV screenshot	Western-field disturbance	Alternative view of localised dark and pale field sector. | Appendix C3.
P2-A6	05/07/2024	Screenshot_58.png	Cropped UAV image	Field surface pattern	Regular and irregular pale/dark marks within cut or reduced cover. | Appendix C3; agricultural alternative prominent.
P2-A7	05/07/2024	Screenshot_59.png	Cropped UAV image	Field surface pattern	Additional darker and pale patch within summer field. | Appendix C3; supporting only.
P2-17	26/12/2025	Screenshot_48.png	UAV screenshot	Middle field	Standing water, saturated tracks and broad dark/pale sectors. | Main winter condition figure.
P2-18	26/12/2025	Screenshot_49.png	UAV screenshot	Tributary comparison	Affected cultivated field beside greener adjoining field with separate dark forms. | Cross-drain comparison.
P2-19	10/01/2026	Screenshot_50.png	UAV screenshot	Location 4 and adjoining fields	Greener winter view with recurring local field and drain expressions. | Wide condition context.

Ref.	Date	Working filename	Source/type	Location/feature	Observation / Purpose
P2-20	10/01/2026	Screenshot_51.png	UAV screenshot	Middle field and farm	Broad field differentiation, local wet ground and drain relationship. | Main January locator.
P2-21	10/01/2026	Screenshot_52.png	UAV screenshot	Differentiated field sector	Large dark area with irregular pale scalloped boundary. | Main developed-feature figure.
P2-22	10/01/2026	Screenshot_60.png	Cropped UAV image	Scalloped boundary sector	Close view of dark interior, pale margin and nearby discrete forms. | Morphology detail.
P2-23	10/01/2026	Screenshot_53.png	UAV screenshot	Main Drain bank	Full relationship between drain, irregular bank and adjoining field forms. | Main bank figure.
P2-24	10/01/2026	Screenshot_55.png	Cropped UAV image	Drain-adjacent field	Dark discrete forms and differentiated belt immediately behind the bank. | Bank-adjacent morphology detail.
P2-25	10/01/2026	Screenshot_56.png	Cropped UAV image	Main Drain bank	Locally irregular or recessed bank geometry with field forms beyond. | Bank detail.
P2-26	21/01/2026	Screenshot_54.png	UAV screenshot	Middle field/residential edge	Extensive pale or white surface differentiation and dark trafficking lines. | Main final-condition figure.
P2-27	21/01/2026	Screenshot_62.png	Cropped UAV image	Residential-edge field sector	Closer view of principal pale/white field manifestations. | Detail paired with P2-26.

B5. Southward and southeastward continuation register

Ref.	Date	Working file	Use	Observation / role
P3-01	10/08/2017	Screenshot_2(2).png	Fig. 37A	Wider early field condition.
P3-02	16/09/2017	image(187).png	Fig. 37B	Corrected working render; red-brown and pale field differentiation.
P3-03	16/09/2017	Screenshot_4(2).png	Fig. 37C	Alternative early field angle.
P3-04	16/10/2017	Screenshot_1(3).png	Fig. 37D	Standing water and raised-field context.
P3-05	27/09/2018	Screenshot_5(2).png	Fig. 38A	Later mottled field and adjoining-sector contrast.
P3-06	07/2021	LGW_LW_July21.png	Fig. 38B	Google Earth crop and tonal response.
P3-07	08/2021	LGW_LW_Aug21.png	Fig. 38C	Google Earth crop and tonal response one month later.
P3-08	09/07/2026	Screenshot_6(2).png	Fig. 39A	Wide recent field condition.
P3-09	09/07/2026	Screenshot_7(2).png	Fig. 39B	Stressed line and clustered point-like disturbances.
P3-10	2018–2022	image(185).png	Fig. 36B	LiDAR-difference context for red-box field.
P3-11	Context	image(186).png	Fig. 36A	Google Earth locator: present field red, next field cyan.
P3-12	07/08/2017	Screenshot_1(4).png	Fig. 40A	Broad initial field condition.
P3-13	16/09/2017	Screenshot_2(3).png	Fig. 40B	Early field-scale differentiation.
P3-14	18/10/2017	Screenshot_3(3).png	Fig. 40C	Boundary and lower-field response.
P3-15	12/10/2017	Screenshot_4(3).png	Fig. 41A	Top-down drainage-side condition.
P3-16	12/10/2017	Screenshot_5(3).png	Fig. 41B	Wider drainage and field context.
P3-17	25/10/2017	Screenshot_6(3).png	Fig. 41C	Extensive landscape and field flooding.
P3-18	19/11/2017	Screenshot_7(3).png	Fig. 42A	Later broad mottled field condition.
P3-19	19/11/2017	Screenshot_8(2).png	Fig. 42B	Alternative mottled-field view.
P3-20	30/12/2025	Screenshot_9(2).png	Fig. 42C	Wide later field with discrete disturbances.
P3-21	30/12/2025	Screenshot_10(2).png	Fig. 42D	Close cluster of exposed or disturbed points.
P3-22	16/10/2017	Screenshot_2(1).png	Fig. 43A	Location 11 sub-area and water context.
P3-23	25/10/2017	Screenshot_3(1).png	Fig. 43B	Pale brown standing water.
P3-24	16/07/2026	Screenshot_4(1).png	Fig. 43C	Dry-season field and margin.

Ref.	Date	Working file	Use	Observation / role
P3-25	16/07/2026	Screenshot_5(1).png	Fig. 43D	Wider dry-season field context.
P3-26	2018–2022	Screenshot_6(1).png	Fig. 43E	LiDAR-difference context.
P3-27	05/10/2017	Screenshot_7(1).png	Fig. 44A	Wider Location 11 locator.
P3-28	14/10/2017	Screenshot_8(1).png	Fig. 44B	Road and field relationship.
P3-29	14/10/2017	Screenshot_9(1).png	Fig. 44C	Narrow field line and wet response.
P3-30	14/10/2017	Screenshot_10(1).png	Fig. 44D	Closer line, water and local staining.
P3-31	30/12/2025	Screenshot_11(1).png	Fig. 44E	Clustered point-like disturbances.
P3-32	30/12/2025	Screenshot_12(1).png	Fig. 44F	Elongated line and small disturbed points.
P3-33	30/12/2025	Screenshot_13(1).png	Fig. 45A	Hex pond and adjoining open water, wide view.
P3-34	30/12/2025	Screenshot_14(1).png	Fig. 45C	Top-down pond and overtopping relationship.
P3-35	09/07/2026	Screenshot_15(1).png	Fig. 45B	Later oblique Hex pond field context.
P3-36	30/12/2025	Screenshot_16(1).png	Fig. 45D	Open-water area and pale grey-brown deposit.
P3-37	30/12/2025	Screenshot_17(1).png	Fig. 45E	Pond margin and apparent channel-like expression.
P3-38	09/07/2026	Screenshot_18(1).png	Fig. 46A	DJI_0275 field; pale and stressed vegetation expression.
P3-39	09/07/2026	Screenshot_19(1).png	Fig. 46B	Extreme close view of small pale discrete emergences.
P3-40	2018–2022	Screenshot_20(1).png	Fig. 46C	LiDAR and contour comparison for Location 11.
P3-41	09/07/2026	Screenshot_21(1).png	Fig. 47A	Wider field-scale crop thinning and pale lineation.
P3-42	09/07/2026	Screenshot_22(1).png	Fig. 47B	Cross-boundary field and developed-edge context.
P3-43	09/07/2026	Screenshot_26(1).png	Fig. 47C	Closer field-boundary relationship.
P3-44	09/07/2026	Screenshot_27(1).png	Fig. 48A	Pale and dark point-like forms in stressed crop.
P3-45	09/07/2026	Screenshot_28(1).png	Fig. 48B	Diffuse branching or fan-shaped pale response.
P3-46	09/07/2026	Screenshot_29(1).png	Fig. 48C	Red-brown linear disturbance within flattened crop.
P3-47	09/07/2026	Screenshot_30(1).png	Fig. 48D	Close red-brown point and line detail.
P3-48	09/07/2026	Screenshot_31(1).png	Fig. 48E	Small pale discrete emergences.
P3-49	Context	Screenshot_32(1).png	Fig. 49	PNR-1z fracture-stage and induced-event location summary.
P3-A1	12/10/2017	Screenshot_1(2).png	App. E1A	Additional drainage-side standing-water view.
P3-A2	16/09/2017	Screenshot_3(2).png	App. E1B	Superseded unbalanced working render.
P3-A3	Source	Screenshot_33(1).png	App. E1C	Archived source screenshot and caption for fracture-summary map.

End of integrated working draft. The principal remaining archival task is replacement of temporary screenshot identifiers with original filenames and metadata; this does not require reopening the established analysis.